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Technology, Motivation, and Multilingualism**

Edited by Dr. Roza A. Valeeva

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Introduction to Issue 9(3)

by Guest Editor Dr. Roza A. Valeeva

Welcome to the special issue of Training, Language and Culture titled *Global Perspectives on Language Education: Technology, Motivation, and Multilingualism*. The contributions gathered here reflect the changes currently redefining language education across the world. As classrooms expand outside of their physical boundaries through digital technologies, as learners grapple with their own motivation in ever more complex settings, and as multilingual realities influence policy and practice, researchers are offering fresh evidence and new perspectives. This issue assembles studies that are united by their concern with how language education adapts to these pressures, while each article foregrounds a different aspect of the global conversation.

One strand of the volume focuses on technology and its role in advancing language learning. In *AI Meets Education: How ChatGPT Transforms Reading Skills in Omani EFL Learners*, Behnam Behforouz and Ali Al Ghaithi investigate how artificial intelligence can supplement traditional instruction. Their study tackles the problem of limited retention in reading comprehension and asks whether ChatGPT can provide added value alongside the classroom. Their results confirm that students who engaged with ChatGPT not only improved their scores more significantly but also sustained these gains over time. These findings add to a growing body of literature that points to the promise of AI tools in supporting self-directed learning and widening access to personalised practice.

The ever so relevant question of technology is also closely tied to learner motivation. In *(De)Motivating Factors of E-Mentoring Integration in English Academic Writing Classrooms*, Heri Mudra looks at how online mentoring alters students' experience of academic writing. The research identifies both motivating and demotivating factors: e-mentoring reduces barriers and facilitates constant communication, yet it can also weaken face-to-face interaction and increase dependence on digital culture. The findings demonstrate the importance of thoughtful integration, showing that e-mentoring must be embedded systematically if it is to strengthen rather than hinder engagement with academic writing.

The motivational aspect is further developed in *The Effects of Task-Based Learning on English Reading Motivation among Vocational College Students*, where Huang Yu, Charanjit Kaur Swaran Singh, and Dodi Mulyadi examine a vocational context in China. As the authors address the persistent problem of low reading motivation, they test whether task-based learning can offer a solution. Their evidence shows that real-life, meaningful tasks improve both motivation and critical thinking. This suggests that curriculum reform in vocational institutions should give greater space to task-based approaches that sustain interest and promote active learning.

A second strand of the issue turns to multilingualism and the influence of first language on second language acquisition. In *The Role of Language Transfer in Arabic-Speaking EFL Learners' Comprehension of Scope Ambiguity in Doubly Quantified Sentences*, Dana Makhoul, Aseel Zibin, and Abdel Rahman Mitib Altakhaneh focus on the area of grammar where learners' L1 exerts a strong effect. Their research demonstrates that while higher proficiency supports comprehension of existential quantifier sentences, numerical sentences remain especially challenging due to structural differences between Arabic and English. The findings attest to the persistent role of language transfer in conditioning learner difficulties and call for targeted instruction to address them.

The institutional aspect of multilingualism is addressed in *A Constructivist Inquiry into English-Medium Instruction in Moroccan Higher Education* by Hassane Razkane, Salah Ben Hammou, and Adil Youssef Sayeh. Morocco's linguistic setting is in flux, with English increasingly viewed as the key to global participation. The authors research student perceptions of English-medium instruction and expose both enthusiasm for English and serious barriers, including underprepared teachers and late exposure to the language. Their analysis points to the need for early English instruction, specialised teacher training, and a balanced policy that values local languages while recognising the global role of English.

A different policy context is the focus of *Economic and Educational Benefits of Mother Tongue and Second Language Use: Evidence from Uzbekistan* by Naylya M. Ibragimova. Using large-scale survey data, the study investigates the relationship between language proficiency and human capital in a multilingual transition economy. The problem addressed is the lack of empirical evidence linking language to income and educational outcomes. The study's findings show that while native language education does not confer significant advantages, second-language proficiency, particularly English, increases earnings by 10–20%. This work provides rare quantitative confirmation of the economic value of bilingualism and stresses the need for policies that expand access to second-language learning.

The theme of curriculum design comes to the fore in *Content-Based Instruction for Psychology Majors: Issues and Solutions for ESP Curriculum Development* by Zinaida I. Berezina. The study showcases the gap between existing ESP provision and the communicative demands of psychology as a discipline. The author analyses psychology-specific texts and compares them with current syllabi to ultimately demonstrate that students are often unprepared for the genres central to their field, such as case reports and ethical documentation. The proposed solution is content-based instruction, a teaching approach that brings language learning closer to the real practices of the discipline and helps students prepare more effectively for their future profession.

Last but not least, in *Cognitive Processing of Educational Polycode Text: An Experimental Eye-Tracking Study*, Inna V. Tubalova and Alena V. Garina focus on what happens when

students engage with texts that combine words and images. The experiment uses data from Russian university students and shows that readers tend to rely most strongly on the verbal component, using it as a guide to interpret the accompanying visuals. This work explains how learners process multimodal materials and reminds us that the design of educational texts matters.

The volume concludes with a book review, which complements the empirical studies by turning attention to the professional lives of teachers themselves. In *Surviving the Induction Years of Language Teaching: The Importance of Reflective Practice*, Thomas S. C. Farrell looks into how early-career teachers can use reflection to deal with the challenges of their first years in the classroom. The review draws out the book's central message: that novice teachers benefit from systematically examining their own classroom practice, their emotions, and their evolving professional identity. Through the case of a Canadian ESOL teacher, Farrell illustrates how reflective practice supports methodological growth and sustains motivation at moments when teachers are most vulnerable to burnout. Placed within the context of this special issue, the review serves as a reminder

that the global developments we trace in technology, policy, and multilingual education are always experienced most directly by teachers. Whether through experimenting with AI tools, adjusting to new language policies, or designing innovative curricula, educators carry the responsibility of translating change into meaningful classroom practice. Reflective practice, as Farrell insists, provides a framework for teachers to adapt, persist, and thrive, ensuring that the advances discussed across this volume are grounded in the lived realities of the profession.

Taken together, the contributions in this issue illuminate the challenges and opportunities facing language education in the 21st century. They show how technological innovation interacts with learner motivation, how multilingual realities affect both acquisition and policy, and how curriculum design must respond to the specific demands of disciplines and modes of learning. It is our hope that readers will find in these pages the evidence of current practice, as well as inspiration for future research and reform in language education.

As always, Training, Language and Culture invites submissions of original research articles, book reviews, and correspondence. For any questions, please contact us at tlcjournal@rudn.ru.



Original Research

AI meets education: How ChatGPT transforms reading skills in Omani EFL learners

by Behnam Behforouz^{1,2} and Ali Al Ghaithi²

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The main objective of this study was to measure the impact of ChatGPT on the reading skills of language learners. Therefore, a total of fifty Omani students with intermediate English proficiency were selected and randomly assigned into two groups, one control group and an experimental group, with an equal number of students in each group. Both groups received the traditional face-to-face training to engage with the reading comprehension skills, techniques, and strategies in understanding the texts and finding answers for various types of questions arising from the test, but the experimental group received extra explanation and practice from ChatGPT. To compare the results in both groups, the researcher developed and modified some reading tests. Their reliability and validity were measured and monitored by the experts. After a month of treatment, the findings revealed that both groups initially received higher scores in the reading posttests compared to their pretests, but the experimental group performed significantly better than the control group. Additionally, further analysis of the delayed posttests of reading showed that the control group had no increment in their scores while the experimental group continued its progress, and performance was significantly higher, suggesting improved retention of reading abilities. The results of this study are useful for teachers, students, and educational institutions.

KEYWORDS: ChatGPT, reading skills, EFL learners, AI, artificial intelligence, chatbot

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1. INTRODUCTION

As Kefalaki et al. (2022) highlight, conventional approaches to language education usually depend on standardised educational programmes and instructional strategies that are unable to meet the diverse needs of learners. Instructors in conventional classrooms may lack the time and tools necessary to modify their lessons to fit every student's demands (Rudolph et al., 2023). With this one-size-fits-all strategy, learners might feel behind or uninterested, which can hinder the growth of their

language skills (Hendriani et al., 2023). In addition, receiving functional feedback on the educational performance in the learning process seems to be one of the challenging criteria (Thi Thuy Oanh & Pham, 2023). Additionally, big class sizes impede instructors from providing personalised feedback, leading to students possibly not receiving timely corrections for their linguistic errors, which reduces their chances for skill improvement (Chiu et al., 2023). In these situations, students may feel frustrated, lose their motivation, and struggle to make progress (Su

& Yang, 2023). Given these constraints, there is an imperative need for novel concepts that may provide tailored support and cultivate dynamic environments for language acquisition. AI-driven technologies like ChatGPT in language teaching enable distinctive educational methodologies for foreign languages by providing tailored assistance and interactive activities (Slamet, 2024).

In the area of language learning and teaching, the use of AI tools attracted some attention. AI might change the directions in language education, providing feedback, and professional development (Kasneci et al., 2023). One such AI tool is ChatGPT, a language model created by OpenAI, which can produce text replies comparable to those of humans (Kim, 2023; Tang, 2023). By realising and questioning user preconceptions and responding automatically to inquiries using hundreds of online resources, ChatGPT sets itself apart from other chatbots and virtual assistants (Hassani & Silva, 2023). By employing artificial intelligence algorithms and large-scale language models, ChatGPT facilitates conversational exchanges with users (Biswas, 2023; Haman & Školník, 2023). A deeper exploration of ChatGPT's potential and preferences by academics guides future educational practices and contributes to the growing body of knowledge about how best to employ AI in language acquisition (Lund & Wang, 2023; Su & Yang, 2023). In this regard, ChatGPT's value as an online language-learning helper becomes clear (Biswas, 2023). Unlike more traditional methods, ChatGPT may be adjusted to fit the requirements of learners by providing them with personalised comments and extra chances for practice (Liebrenz et al., 2023; Qureshi et al., 2023). ChatGPT may assist learners in developing their language abilities by focusing on areas where they need the most help, using deep learning algorithms and massive models of language analysis of student input. Moreover, ChatGPT's interactive features could provide a dynamic and fascinating classroom environment (Rudolph et al., 2023; Shen et al., 2023). Using real-time interactions among peers, ChatGPT lets learners hone their language skills in a natural environment (Hassani & Silva, 2023; Seetharaman, 2023).

Reading is an important ability during educational studies. Some people may think that reading is a basic skill, but it is a complicated process that requires several different skills (Rudolph et al., 2023). Students need to improve their vocabulary and analytical skills to do well on reading comprehension tests. Pido and Mubarakah (2024) show that teachers can help students understand what they read better by using skimming and scanning techniques in reading activities, customising instruction for each student, identifying key points, and encouraging fast reading. Since skimming and scanning techniques improve students' understanding of what they read (Basri et al., 2022), skimming literature may help students understand the author's tone or intonation (Mokalu et al., 2022), help them understand the structure of the text, and facilitate easier reading. On the other hand, scanning may help pupils make the most of their time by making it easier to get information from reading (Gulo, 2020). This strategy became obsolete as most learners

experienced challenges in reading. Because of this, the teacher needs to help the students develop useful reading abilities. To engage in skimming and scanning activities, technology tools could be employed, including AI-assisted instruments, to cultivate an effective teaching environment that enhances students' fundamental reading skills (Pido & Mubarakah, 2024). As a result, AI can be used to improve English lessons for students, particularly in reading. It can be used to make learning more interesting and lead to better grades (Li & Xu, 2020).

In a recent study, Kwon and Lee (2023) investigated the accuracy of ChatGPT in responding to English reading comprehension questions on CSAT and TOEFL iBT. The results showed that ChatGPT could accurately answer nearly 69% of the questions provided. When it came to question typologies, ChatGPT accurately responded to approximately 75% of factual/inferential-type queries and more than 87% of fill-in-the-blank and summary-type ones. Nonetheless, its accuracy rate for vocabulary and grammar tests was much lower than this. However, ChatGPT PLUS, the latest model built on GPT-4, had a proficiency rate of 93%, including vocabulary and grammar. With a comparable objective, Ahn (2023) assessed the effectiveness of ChatGPT on CSAT English reading comprehension test items. In the experiment, ChatGPT achieved a 74% accuracy rate in providing the right responses. The study thus proposes that the performance of ChatGPT could be enhanced by improving training techniques, integrating varied and well-balanced datasets, and using human-AI collaboration. The study also specified testing item categories that ChatGPT could enhance, such as finding the optimal sequence of events in a narrative, detecting pronoun referents, and arranging sentences correctly. Shin (2023) examined the capacity of ChatGPT to create reading comprehension items as an assessment developer. The results indicated that some inquiries necessitate certain criteria for their appropriate design. Consequently, the various types of inquiries encompassed the identification of the contextual significance of underlined phrases, the sequencing of sections within a passage, and the determination of the mode of the text. Through the analysis of measures, the study offered tailored prompts for several categories of reading comprehension questions, as well as suggestions for constructing questions when utilising ChatGPT.

Amidst the present combination of doubt and hope regarding AI, especially ChatGPT, it is crucial to acknowledge that the teaching of a second language (L2) requires research focused on the classroom that may showcase the practicality of this technology for L2 instructors and practitioners (Shin & Lee, 2023). Li et al. (2024) stated that the existing literature on the use of ChatGPT failed to cover the necessities and techniques to use it appropriately within the English reading learning and teaching process. Additionally, Al-Otaibi and Al-Homidhi (2025) believed that there is a lack of sufficient studies and references on the integration of ChatGPT and English language learning in higher education. Therefore, the purpose of this study is to evaluate the effectiveness of ChatGPT in enhancing the reading

comprehension abilities of Omani EFL learners at the college level. This study holds significance in the context of EFL education by exploring the potential of AI technologies, specifically ChatGPT, in providing personalised and adaptable learning experiences. Based on the purpose of the study, the following question will be covered in this study: to what extent does the use of ChatGPT as a facilitator improve the reading comprehension abilities of Omani EFL learners compared to traditional face-to-face instruction?

2. THEORETICAL BACKGROUND

2.1. Reading skills and AI integration

Hidayat (2024) examined the effectiveness of customised reading systems based on artificial intelligence in improving reading comprehension for Indonesian senior high school students. The study included 85 students divided into a treatment group and a control group following the traditional curriculum. Using the AI system, modern algorithms generate personalised reading materials based on the student's comprehension level, interests, and learning style. The findings demonstrated that the AI-based platform significantly enhanced reading comprehension of the experimental group, as evidenced by significantly better results compared to the control group. The strength of the study is a clear design of a quasi-experimental approach that aligns the objectives, instruments, and statistics, and explicitly states that AI-based platforms assist learners in improving their reading skills. However, the study suffers from a short intervention period and a lack of clear statistics to measure longer retention.

Kim (2018) examined the impact of chatbots on the English listening and reading skills of 46 college students. The experimental group interacted with a chatbot named Elbot for 16 weeks, participating in 10 sessions focused on their daily lives. The findings revealed that using chatbots could increase the scores of the experimental group in reading comprehension. One of the strengths of this study is the employment of a controlled testing approach via TOEIC tests, which empirically measure the effects of using chatbots on receptive language skills and support the pedagogical values of chatbot-assisted learning in Korean EFL contexts. However, the weaknesses of the study are the small population size, the short treatment period, and the possible Hawthorne effect, which may limit the generalisability of the study.

Xu et al. (2021) conducted a study to examine learners' performance based on reading comprehension skills in two distinct environments: human-to-human interaction and chatbot-assisted settings. The students in the experimental group received guidance on how to comprehend the narrative from the chatbot. Conversely, students in the control group were given identical instructions by a human instructor. The study's findings indicated that the learners who engaged in directed communication with conversational agents completed story comprehension questions more frequently than those who did not engage in guided conversation. One of the strengths of this study is that the randomised experimental design with the preschool

learners to compare the AI conversational agent and partners' narrations could provide better information on the linguistic outcomes, such as productivity, intelligibility, and lexical diversity. However, the lack of longitudinal monitoring, limited demographic variables such as linguistic background, and the lack of information on whether the conversational agents provide social-emotional support are among the study's weaknesses.

Behforouz and Al Ghaithi (2024) assessed the impact of the design and implementation of artificial intelligence on English language acquisition. An interactive chatbot was developed utilising programming languages to evaluate the effect of instruction delivered through the bot on the reading skills of Omani EFL students at the intermediate competency level. The results of the study indicated that the experimental group, which utilised the interactive chatbot as a learning facilitator, outperformed the control group that received solely traditional in-class teaching. The strength of this study is that it uses validated and reliable tests to provide adequate information on the efficacy of interactive chatbots in the reading comprehension process, but its short intervention period, absence of qualitative data, and the single-institution sampling are among the weaknesses of the study.

Jin (2024) examined the incorporation of artificial intelligence technology into English reading instructions in senior high school environments. The study explored several AI apps emphasising the enhancement of reading comprehension abilities, personalised learning experiences, and adaptive evaluation and feedback mechanisms. The results indicated that the incorporation of AI into English reading instruction improved student engagement and motivation through tailored learning experiences and interactive methods. The strength of the study lies in the conceptual framework, which was provided by integrating AI-driven tools into the learning process, supported by comprehensive teaching cases that demonstrate real classroom implementation. The weaknesses of this study include the shortage of empirical data and control group comparisons.

2.2. ChatGPT and reading skills

Wang and Feng (2024) examined the effect of ChatGPT assistance on reading skills over 4 weeks involving 83 Chinese undergraduate students. The learners were divided into two distinct groups, one relying on conventional paper-based reading while the other utilised ChatGPT for reading support. The findings demonstrated that, compared to the paper book group (63% understanding rate and an average rating of 52/100), the ChatGPT-assisted group performed better in their book evaluations, with an average rating of 76/100 and a reading comprehension rate of almost 86%. According to the results, integrating ChatGPT may significantly improve Chinese students' comprehension of English and their interest in reading English books. The lack of long-term effects could be considered a weakness of this study. Zhang et al. (2025) conducted a study on a novel reading platform powered by ChatGPT, which has rapidly gained popularity as a research assistant among students, owing to its

immediate natural language interaction and question-answering functionalities. Sixty-four undergraduate students were recruited for participation in this quasi-experimental investigation. Substantial disparities were identified between the two groups following the intervention. The characteristics of the ChatGPT-based reading platform resulted in the experimental group students experiencing reduced foreign language reading anxiety and cognitive load compared to the control group. Moreover, they surpassed the control group in critical thinking and academic reading performance. The strength of this study was the implementation of a quasi-experimental study with the combination of quantitative and qualitative data supporting a holistic viewpoint of the impact of AI chatbots on reading performance and motivation among Chinese students. However, the small sample size and the lack of measures for the long-term effect of AI tools could be considered as the weaknesses of this study.

Muman (2025) investigated the effect of ChatGPT-OpenAI and its potential to enhance learners' reading skills. The researcher employed the classroom action research approach to gather and analyse the data among vocational high school students. The findings indicate that ChatGPT-OpenAI serves as a practical teaching resource for enhancing English reading proficiency in vocational schools. This research suggests that teachers should recognise the significance of the 21st century, wherein ChatGPT-OpenAI is a crucial tool that educators must grasp to enhance students' reading skills. The strength of this study is its efficacy in demonstrating the potential of using ChatGPT in improving the reading skills of students by providing structured intervention supported statistically and perceptually. However, the small sample size, lack of control group and some technical barriers could be among the weaknesses of the study.

Amimi and Saragih (2025) examined the impact of ChatGPT utilisation and reading literacy on the learning interest of Business Education students from the 2022 cohort at the Faculty of Economics, State University of Medan, among 63 learners. The analysis results indicated that ChatGPT positively influenced students' learning interest, evidenced by a t-count of 6.447 and a significance level of 0.000. Furthermore, reading literacy exerted a beneficial influence, evidenced by a t-count of 5.471 and a significance level of 0.000. The combined utilisation of ChatGPT and reading literacy accounted for 62.3% of students' enthusiasm in learning. Using robust statistical evidence and offering a data-driven foundation to integrate AI and literacy into digital pedagogy is a notable strength of this study. However, using an ex post facto design, a single-institution scope, and reliance on self-reported surveys are the limitations of the study.

3. MATERIAL AND METHODS

This section is dedicated to the selection procedures of the participants for the study, the steps of designing, piloting, and validating the instruments and tests, and the way SPSS 27.0 and JASP 0.95 were used to analyse the data from the performance of the learners.

3.1. Participants

To conduct this quasi-experimental research study, 50 Omani EFL learners from a higher education institution in Oman were randomly assigned to an experimental group and a control group, with 25 students in each group, comprising both males and females. The English proficiency level of these learners was determined to be at the intermediate level based on the university's placement test. These students were native Arabic speakers, and their ages ranged from 18 to 20 years old. These students were studying in the Foundation Programme, in which they had to study some modules on English, Math, and IT, and upon passing the final assessment, they were eligible to move to their specialisations in higher education departments.

3.2. Instruments

3.2.1. Reading tests

To compare and measure the performance of students in both groups on reading skills, three sets of tests, including pretest, posttest, and delayed posttest, were designed. The tests were aligned with three types of questions, including five multiple-choice questions, five true and false questions, five matching questions, three fill-in-the-blank questions, and two short-answer questions. To ensure the reliability of the tests, a pilot study was conducted before the main round of the study with 25 random Omani EFL learners in the same institution and with the same English proficiency level. Table 1 below shows the results of Cronbach's Alpha for the reliability indexes. Following the reliability, the questions were reviewed by two Omani PhD holders in applied Linguistics to validate the questions.

3.2.2. Reading passages and strategies

The reading passages that were practised during the treatment period were selected from NorthStar3, the Reading and Writing, 3rd Edition. Pearson Education Limited designs these books for GCC (Gulf Cooperation Council) countries. Four reading passages with all the questions were selected from this book. Although there are pre-reading to post-reading strategies that could be covered while working on a text, the following few strategies were covered in this study during the treatment.

Prior Knowledge Elicitation. Ask students to either generate or reflect on what they already know about a subject being read.

Reading Objective. The reader sometimes reads to gain specific information, but at other times, the purpose is to understand the main idea. This allows students to focus their attention and be more active with the text.

Predicting. Engage students in making predictions based on titles, headings, or pictures. Prediction leads to curiosity and active participation.

Skimming. Have students skim through the text quickly to get an overview of how the text is structured and what the text is all about before they proceed to its specifications.

Scanning. Have students do the scanning activity to find information such as the names, dates, and facts. Such an activity will provide an easy way to retrieve important information.

Table 1
The results of the reliability index for all sets of tests

TESTS	NUMBER OF ITEMS	CRONBACH'S ALPHA
Pretest	20	0.856
Posttest	20	0.870
Delayed posttest	20	0.869

Contextual Guessing. Teach students how to infer the meaning of unfamiliar words from their surrounding context rather than immediately reaching for a dictionary.

3.3. Ethical Considerations

Before the study began, ethical approvals were received from the Research Department and the related authorities within the institution. In addition, students were informed and signed the consent form, agreeing that their participation in this study is voluntary and will not affect their regular performance or the continuous assessment. It was also emphasised that the results of their performances will remain confidential and will not be shared publicly.

3.4. Procedure

The present investigation was conducted during the autumn semester of 2024-2025. Participants were informed that their participation in the study was voluntary. Prior to the treatment, and to ensure the homogeneity of students' knowledge of reading skills, a pretest of reading was conducted. After that, students were divided into two groups, including a control group and an experimental group. The treatment period lasted for a month, and according to the curriculum and delivery plan, two sessions, each lasting one hour and forty minutes, focused on reading comprehension activities; therefore, eight reading passages were covered during the treatment. The control group received training and instruction on reading skills, finding answers to various questions, and some reading techniques, such as skimming and scanning, with extra practices within the classroom and through traditional face-to-face teaching techniques. The teacher regularly monitored the students in the class through observation and question-and-answer sessions, and provided extra quizzes. On the other hand, although the experimental group received in-class instructions on reading skills and techniques to cope with different types of questions, the students were instructed to use ChatGPT to practice extra reading comprehension activities, such as creating questions, understanding the general idea, and the main idea. All participants in the experimental group were allocated a ChatGPT account established by the researchers to enable the teacher to oversee the students' progress in ChatGPT, verify adherence to instructions, and ensure the completion of assignments as stipulated by the researchers. Subsequently, the investigator facilitated a one-hour workshop to

instruct the treatment groups on utilising ChatGPT for reading skills improvements and to resolve any potential concerns. Various activities were assigned to the students to use ChatGPT outside of the class setting. ChatGPT could help the students with the opportunity to further their practice to pose follow-up questions, seek clarification on complex vocabulary, or even produce summaries. The instructor motivated learners to participate in meaningful conversations with ChatGPT, which posed comprehension inquiries or stimulated students to anticipate the subsequent events in a narrative. To enhance participation, the teacher instructed students to use ChatGPT to generate their inquiries regarding the reading material and then engage in a quiz amongst themselves in pairs or groups during the upcoming class. These exercises facilitated dynamic learning and provided essential support for learners to enhance their reading abilities, providing both structured instruction and independent practice inside the classroom. As an example (see Appendix), students took a paragraph from the text, made a one-sentence guess about its main idea, and then asked ChatGPT to come up with one literal and one inferential question. Students should answer these questions before looking at any key. Additionally, students asked ChatGPT to find 6 to 8 essential words from the same paragraph and requested a definition, two common collocations, one word-family item, and a contrast for each word. In the next step, students asked ChatGPT to make a six-item cloze exercise from the text, and they tried it without the answer key, and then got feedback on whether it was correct or incorrect. Finally, it should set up a one-minute micro-quiz for the next day. The following week after the end of the treatment, a posttest was conducted to compare the performance of both groups before and after the treatment. A delayed posttest was conducted to measure students' knowledge retention and the efficacy of using ChatGPT three weeks after the treatment period.

4. STUDY RESULTS

Before conducting any test for comparison purposes, it was mandatory to measure the normality of data, which was useful in selecting appropriate parametric or non-parametric tests. Therefore, a Kolmogorov-Smirnov normality test was conducted (Table 2). Table 2 shows that for the pretest, the control had a statistic of 0.229 at 0.002 significance, while for the experimental group, it was 0.222 at 0.002. There is a significant deviance from normality in both groups ($p < 0.05$). The posttest

showed that in the control group, the statistic was 0.178 with a significance of 0.040, whereas in the experimental group, the statistic stood at 0.194 with a significance of 0.016. These results

show both groups continue to be deviant from normality. In the delayed posttest, the control group had a statistic of 0.181, p -value=0.035, while the experimental group had a statistic of

Table 2

The results of the data normality in all sets of the tests

	GROUPS	KOLMOGOROV-SMIRNOV		
		STATISTIC	df	Sig.
Pretest	control	.229	25	.002
	experiment	.222	25	.003
Posttest	control	.178	25	.040
	experiment	.194	25	.016
Delayed posttest	control	.181	25	.035
	experiment	.205	25	.008

0.205, p -value of 0.008, showing another significant deviation from normality. Based on the normality results, the non-parametric test seemed a suitable option to measure the results of tests within the control group.

Table 3 below shows the performance of the control group in all sets of tests. Table 3 revealed that an Asymp. Sig. of <.001 and a Friedman Test Chi-Square of 45.238 with 2 degrees of freedom imply that the difference across pretest, posttest, and

delayed posttest scores within the group has reached significance, hence justifying further post-hoc tests in pointing out the exact locations of these differences. Table 4 provides more details on the performance of the control group and shows the differences in the scores across the pretest and posttest, as well as the posttest and the delayed posttest. The Sig. for the pretest and posttest comparison is less than .001, indicating this difference is significant. That means that the scores significantly differ

Table 3

The Friedman test results for the control group

N	Chi-Square	df	Asymp. Sig.
25	45.238	2	.000

across these two testing times. However, the Sig. for the posttest and delayed posttest is .096, which is not statistically significant at $p > 0.05$. This would mean that the difference in performance between the posttest and delayed posttest was not significant. To continue with the analysis of the data, a Wilcoxon signed-rank test was conducted to measure the performance of students in the experimental group. Table 5 that there are statistically significant differences in the experimental group's performance across all sets of tests. In the posttest versus pretest test, the test obtained an observed Z-value of -4.438 with Sig. of .000. This is thus a significant improvement from the pretest to the posttest. Also, the comparison of delayed posttest versus posttest yields a Z-value of -4.476, with a Sig. of .000 again, indicating continued statistical improvement in the delayed posttest statistics. Thus, the results again show consistent progress in the experimental group over time. Table 6 provides more information about the

comparison of these sets showing that there were significant differences between the pretest and posttest and between the posttest and the delayed posttest of the experimental group. The comparison across pre- and posttest shows a statistically significant increase from pretest to posttest since the Sig. is less than .001 with the Std. of -4.953. Moreover, by comparing the posttest to that of the delayed posttest, Sig. 2-tailed is also less than .001 with a standard of -4.650, showing that the difference between these two-time measures is significant. From this finding, it can be suggested that there was a significant improvement in the experimental group from the pretest to the delayed posttest and that there was a measurable increase at each juncture.

To compare the results of the two groups in all the tests together, a Mann-Whitney U Test was conducted, and the results can be seen in Table 7 that revealed no statistically significant difference between the experimental and control groups at the

Table 4
Marginal homogeneity test

	PRETEST & POSTTEST	POSTTEST & DELAYED POSTTEST
Distinct Values	8	6
Off-Diagonal Cases	25	9
Observed MH Statistic	298.000	129.000
Mean MH Statistic	335.500	131.500
Std. Deviation of MH Statistic	7.921	1.500
Std. MH Statistic	-4.734	-1.667
Asymp. Sig. (2-tailed)	.000	.096

Table 5
The results of the performance of experimental group in all tests

	POSTTEST – PRETEST	DELAYED POSTTEST – POSTTEST
Z	-4.438	-4.476
Asymp. Sig. (2-tailed)	.000	.000

Table 6
The results of the marginal homogeneity test

	PRETEST & POSTTEST	POSTTEST & DELAYED POSTTEST
Distinct Values	10	7
Off-Diagonal Cases	25	25
Observed MH Statistic	293.000	438.000
Mean MH Statistic	365.500	458.000
Std. Deviation of MH Statistic	14.637	4.301
Std. MH Statistic	-4.953	-4.650
Asymp. Sig. (2-tailed)	.000	.000

pretest stage ($p = .478$, CI: -0.410 to 0.208), with a negligible effect size ($r = -0.112$), indicating that both groups began at a comparable level. A statistically significant difference was seen at the posttest stage ($p < .001$, CI: 0.665 to 0.896), with a considerable effect size ($r = 0.810$, CI: 0.988 to 0.997), demonstrating a notable impact of the intervention on the performance of the experimental group.

The difference grew even bigger in the delayed posttest ($p < .001$), and the effect size grew to 0.994 , which means that the experimental group got a significant and long-lasting benefit over time.

5. DISCUSSION

The study objective was to examine the impact of using ChatGPT on reading comprehension. 50 Omani EFL learners were split into two groups, each comprising 25 students, namely the control group and the experimental group. Each group received distinct methodologies of instruction: the control group received conventional face-to-face teaching, while the experimental group received ChatGPT-enhanced learning. Assessment of reading skills performance and retention was conducted by administering three reading tests, including a pretest, a posttest, and a delayed posttest. After one month of teaching and

Table 7
The results of the comparison of both groups in all tests

							95% CI for Effect Size	
	Test	Statistic	df	p	Effect Size	SE Effect Size	Lower	Upper
pretest	Student	0.716	48	.478	0.202	0.284	-0.355	0.757
	Mann-Whitney	347.500		.478	-0.112	0.163	-0.410	0.208
posttest	Student	-6.710	48	< .001	-1.898	0.390	-2.562	-1.220
	Mann-Whitney	59.500		< .001	0.810	0.163	0.665	0.896
delayedposttest	Student	-10.610	48	< .001	-3.001	0.510	-3.809	-2.178
	Mann-Whitney	2.000		< .001	0.994	0.163	0.988	0.997

subsequent testing, the results showed that although both groups showed progress from pretest to posttest, the experimental group performed better than the control group. In addition, the comparison of the delayed posttest between the groups revealed that the control group showed no progress, while the results of the experimental group were significantly positive. The research findings indicated that the use of ChatGPT had a substantial positive impact on reading comprehension and retention after exposure.

The only improvement from the pretest to the posttest was seen in the control group that got face-to-face instruction from a teacher. This improvement can be understood through Vygotsky's (1978) Sociocultural Theory and the concept of the Zone of Proximal Development (ZPD), which emphasises that learners progress most effectively when supported by a more knowledgeable individual through social interaction and scaffolding. This study indicates that the teacher's guided practice, direct interactions, and prompt feedback likely offered scaffolding that facilitated students in attaining enhanced levels of reading comprehension on the posttest. This aligns with Rosenshine's (1987) Principles of Direct Instruction, which stress the necessity of structured, sequential teaching coupled with active oversight and feedback for prompt enhancements. However, without extended practice or adaptive reinforcement, the control group showed no improvement in the delayed posttest.

The experimental group that used ChatGPT to learn outperformed the control group on both the posttest and the delayed posttest. This aligns with Self-Determination Theory, which posits that fulfilling learners' needs for autonomy, competence, and relatedness boosts intrinsic motivation and ongoing engagement (Deci & Ryan, 2000). ChatGPT's personalised feedback and flexible coaching may have bolstered students' perceptions of competence and autonomy, thereby prolonging their drive. Constructivist Learning Theory (Bruner, 1996; Piaget, 1972) asserts that ChatGPT's interaction facilitates learners in actively constructing meaning and integrating new knowledge with pre-existing understanding, rather than only taking

information passively. Cognitive Load Theory asserts that reducing superfluous cognitive load enables learners to allocate more cognitive resources to the learning of essential knowledge (Sweller, 1988). This study indicates that ChatGPT's prompt clarifications and targeted responses may have mitigated unnecessary cognitive burden, hence enhancing learning efficacy. The experimental group's persistent dominance in the delayed posttest exemplifies Spaced Retrieval Practice Theory, since ChatGPT enabled frequent, spaced interactions with reading skills, hence improving long-term recall (Cepeda et al., 2006). The findings of this study align with prior research, including a study by Miller (2019), which demonstrates that AI systems deliver reading content tailored to the reader's comprehension level for individualised learning methods. Liu et al. (2019) conducted a similar study that showed AI can find problems that students have when they read, which allows teachers to give each student personalised help. In a similar study, Salam et al. (2023) showed that the integration of ChatGPT into the educational process significantly impacts students, as seen by improvements in reading proficiency. Moreover, Behforouz and Al Ghaithi (2024) investigated the role of an interactive chatbot as a facilitator in reading, illustrating that chatbots can serve as advantageous tools in education, especially in improving reading proficiency. Sosa Daza et al. (2024) examined ChatGPT-based interventions to enhance English reading proficiency among senior high school students. The main findings showed that 84.7% of teachers were very interested in using ChatGPT for teaching purposes.

6. CONCLUSION

The educational applications of ChatGPT have demonstrated considerable promise, namely in augmenting individualised learning and delivering immediate feedback to students, therefore enabling them to participate in self-directed learning (Kasneci et al., 2023). An illustration of its use in language instruction is its capacity to assist pupils in enhancing their grammar and writing abilities through interactive conversation (Zhai,

'By integrating AI into higher learning and further utilising ChatGPT, the outcomes of educational institutions could be scaled up. It extends the learning experience beyond traditional class hours and allows for more dynamism through the integration of technology in education, which should ultimately translate into better academic performance and put schools at the forefront of modern teaching methodologies'

2023). To this end, this paper's focus was on the integration of ChatGPT in English language classes to improve the reading skills of Omani EFL learners. The comparison of the performance in both groups in posttest and delayed posttest revealed that the experimental group outperformed significantly in all of the tests. This could be attributed to the involvement with ChatGPT outside of the educational setting, which also played a role in the enduring advantages noted in the experimental group.

The results of this study could be helpful for teachers, students, and institutions. For teachers, using ChatGPT will improve pedagogic methods, the ability to provide feedback in a highly individualised form and to support self-directed learning. Students can learn alone and receive errors corrected immediately. Students benefit from increased engagement and more frequent opportunities for interactive practice, resulting in better retention and understanding. By integrating AI into higher learning and further utilising ChatGPT, the outcomes of educational institutions could be scaled up. It extends the learning experience beyond traditional class hours and allows for more dynamism through the integration of technology in education, which should ultimately translate into better academic performance and put schools at the forefront of modern teaching methodologies.

Despite the encouraging results, some constraints of the present study must be recognised. The sample size of 50 participants was relatively small, which may limit the generalisability

to larger populations of EFL learners. Besides, this research was focused on only Omani learners; therefore, cultural or linguistic variables pertinent to them could have intervened in the results. Another limitation was that the intervention period was short, lasting only one month; this might not be enough to gauge the long-term effects or sustainability of improvements in reading comprehension. In addition, this study depended primarily on reading tests for assessment; hence, other aspects of language learning had not been taken into consideration, like writing or speaking. The other limitation of this study could be a lack of qualitative data on the learners' attitudes toward using AI tools within the learning context. Additionally, there was no analysis on the impact of teachers' and students' digital literacy, and local educational norms in this study. Some factors, such as students' exposure to AI tools and their general knowledge about using technology, were not considered in this study, which could affect the findings. Finally, factors such as students' motivation and perceptions toward using technology, that could lead to changes in the results, were not covered in this study.

Therefore, further studies could involve a larger sample of students representing diverse English proficiency levels and a range of institutions, in order to gain a more detailed understanding of AI adoption in Oman. To evaluate the effect of ChatGPT and other AI tools for long-term applicability in the learning process, studies with more treatment time are suggested. Additionally, more studies are suggested to measure other main skills and subskills in language learning, such as writing, speaking, and grammar.

Moreover, future studies should use various types of evaluation instruments besides reading comprehension tests to offer a more complete account of language competence. Further studies based on a qualitative research design could provide a more precise picture of AI-enhanced learning within the Omani EFL learning context. An examination of external elements, such as student motivation, attitude, previous technological experience, and the influence of instructor facilitation, would explain more clearly how these variables impact the efficacy of AI tools in language acquisition.

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Appendix

Sample conversation between a user and ChatGPT

User: Here is the paragraph: 'Every Saturday, a group of neighbors meets to clean the small river near their homes. They wear gloves and collect plastic bottles, cans, and other trash. The city gives them free bags and shows them how to recycle the materials. After three months, the water looks clearer, and more birds come to the trees. The group also teaches children about keeping the area clean. They post simple tips online, like 'bring your own bottle' and 'use fewer plastic bags.' The neighbors feel proud because the area is safer and more beautiful.'

ChatGPT: Thank you. Please write one sentence that guesses the main idea.

User: Neighbours clean the river every week, and the area becomes cleaner and better.

ChatGPT: Good. Now two questions.

1. Literal: Who gives the group free bags?
2. Inferential: Why do more birds come to the trees?

User: 1. The city gives the free bags. 2. Because the river is cleaner and safer for birds.

ChatGPT: 1. Correct. The text says, 'The city gives them free bags.' 2. Good inference. The text says, 'the water looks clearer,' which supports your idea.

User: Please find 6 priority words and give for each: meaning in this context, two collocations, one word-family item, and one contrast.

ChatGPT: Here are 6 words.

1. **collect** – meaning: pick up and bring together. Collocations: collect trash, collect bottles. Word-family: collection. Contrast: scatter.
2. **recycle** – meaning: process used items so they can be used again. Collocations: recycle materials, recycle plastic. Word-family: recycling. Contrast: waste.
3. **clearer (clean)** – meaning: more clean and easy to see. Collocations: clearer water, clearer view. Word-family: clarity. Contrast: dirty.
4. **proud** – meaning: happy because of good work. Collocations: feel proud, proud of the team. Word-family: pride. Contrast: ashamed.
5. **safer (safe)** – meaning: with less risk of danger. Collocations: safer area, feel safe. Word-family: safety. Contrast: dangerous.
6. **beautiful** – meaning: very nice to see. Collocations: beautiful place, beautiful view. Word-family: beauty. Contrast: ugly.

User: Make a six-item cloze (gap-fill) from the same paragraph. Hide the key.

ChatGPT: Cloze (fill in one word for each blank):

1. Every Saturday, a group of _____ meets to clean the small river.
2. They wear gloves and _____ plastic bottles, cans, and other trash.
3. The city gives them free bags and shows them how to _____ the materials.
4. After three months, the water looks _____, and more birds come.
5. The neighbors feel _____ because the area is safer and more beautiful.
6. They post simple tips online, like 'bring your own _____.'

User: My answers:

1. neighbors. 2. collect. 3. recycle. 4. clearer. 5. proud, safer. 6. bottle.

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Original Research

(De)Motivating factors of e-mentoring integration in English academic writing classrooms

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It remains unquestionable that learning a language such as English through online mode may have transformative impacts on students' motivational process. Grounded from the rationale, this study explored EFL students' (de)motivating factors in integrating e-mentoring methods during academic writing projects. Thirteen selected university students with different demographic variables (i.e., grade, gender, university, age, language proficiency) attended multiple interviews, focus group discussions, and classroom observation as data collection methods. The data were analysed through the integration of IDEEAS framework, consisting of Inclusion, Design, Engagement, Evaluation, Assessment, and Support phases and a descriptive statistical analysis. The findings are twofold. First, e-mentoring motivated EFL students to engage with academic paper writing as it effectively reduced cultural and linguistic barriers (i.e., through online tutorials, games, or discussion), promoted always-on communication (i.e., through synchronous and asynchronous modes), and relied on process rather than product (i.e., through dialogic syllabus). Nevertheless, e-mentoring remained demotivating for the students as it concerned with verbalised communication, threatened face-to-face interaction, and caused them to rely on online culture. This study implies that university stakeholders, mentors, or supervisors have to integrate e-mentoring into English learning curriculum and facilitate online learning procedures systematically. In short, motivating and demotivating factors in e-mentoring process remain critical as academic paper writing cannot be successfully engaged with online meeting. The e-mentor has to implement particular strategies by intensively utilising online apps to increase effective communication and overcome drawbacks during the academic writing project.

KEYWORDS: e-mentoring, academic writing, motivating factors, demotivating factors, EFL, English as a foreign language

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1. INTRODUCTION

Teacher support positively impacts students' academic success, including writing an English paper for academic publication. Academic writing (henceforth AW) comprises complex content and structure that may hinder university-level English-as-a-foreign language (henceforth EFL) students from encouraging their writing motivation (Alzubi & Nazim, 2024;

Phyo et al., 2024; Mohammed & Al-Jaberi, 2021). The external barrier of AW refers to stricter guidelines offered by every academic journal for those who intend to have their papers proceed. Internal and external writing barriers must be managed through intensive, ubiquitous communication between university EFL teachers and students. Classroom meetings cannot be the only option to discuss AW development, which

consists of preparing, outlining, drafting, researching, revising, and reporting stages. In this case, synchronous or asynchronous communication through an electronic mentoring (henceforth e-mentoring) method is an appropriate decision for an AW teacher-supervisors to facilitate students' barriers before, during, and after writing an academic paper (Kumar et al., 2023).

E-mentoring emerges as a transformative method for facilitating a writing project that requires procedural writing accomplishment and how a teacher-mentor approaches student-mentees with communicative online interactions ubiquitously. Many EFL students prefer a variety of online communication due to its access and confidentiality level (Han et al., 2024; Lacombe et al., 2024; Osiyanova et al., 2024). E-mentoring integration leads to AW motivation among students even though they may be challenged with online learning barriers. Both motivation and demotivation in an e-mentoring method theoretically conceptualise direct academic balance when writing an academic paper, as students have different tendencies to interact with their teacher-mentor during a writing project.

This study began from an optimistic assumption, stating that e-mentoring contains more than a mere online discussion; instead, it reveals the way EFL teachers deliver information and the attitude EFL students engage to undertake such transactional dialogue online. Although such a topic has been recently promoted through several studies, such as youth e-mentoring (Kaufman et al., 2024; Wright et al., 2024; Gafni-Lachter et al., 2021), mutual e-mentoring (Wang et al., 2023; Hardt et al., 2022), e-mentoring preparation and design (Kaçar & Baltacı, 2023; Cicchinelli & Pammer-Schindler, 2021), and e-mentoring intervention (Kumar et al., 2023; Mullen, 2023; Arnold et al., 2022), a specific focus on psychological insights regarding e-mentoring in English AW remains unidentified. This rationale was configured as a counterpart to fill the gap that has not been previously scrutinised.

This study aimed to uncover motivating and demotivating rationales that lead university EFL students to utilise e-mentoring during an academic paper writing project. The AW project was focused on some specific competences developed based on language proficiency, including grammar accuracy, vocabulary, and the skills to deal with sources, such as summarising, synthesising, and paraphrasing ideas. It also concerned with genre conventions which direct EFL students to follow a paper structure, including IMRaD (Introduction, Method, Results, and Discussion) and citation or referencing. As for cognitive command, the EFL students were encouraged to transform descriptive into analytical thinking, which required them to have high level of metacognitive awareness or abstract reasoning.

Meanwhile, the significance of this study is twofold. First, it implies that a pedagogical process needs to be enhanced through various teaching and learning methods, including offline and online modes. Second, it sheds light on how linguistic competence transformed teachers' and students' communication strategies, such as open communication, fast corrective feedback, or active listening. On the other side, this study is different from earlier

concerns. It employed EFL students to begin to experience writing a journal paper. The students were not experienced in learning English through any e-mentoring application. They studied English in a rural university, indicating they share a unique learning culture and attitude towards technology in AW classrooms.

This study comprised two research questions:

RQ1: How does e-mentoring integration motivate EFL students to write an academic paper?

RQ2: Does the e-mentoring method remain demotivating for such a writing project?

2. THEORETICAL BACKGROUND

2.1. IDEEAS framework

IDEEAS, which stands for *Inclusion, Design, Engagement, Evaluation, Assessment, and Support*, is used as a theoretical framework in this study. IDEEAS is a newly developed framework that facilitates comprehensive engagement in online teaching and learning, ranging from preparation to feedback. The main goal of this framework is to promote effective online pedagogical practices for teachers when delivering a course and for students experiencing transformative learning outcomes (Martin & Ritzhaupt, 2023). In addition, it provides both theoretical and practical guidelines for online teachers to establish teaching and learning inclusion in online settings. There is an interrelation among the six factors of the IDEEAS framework, stating that each instructional process influences the sustainability of another pedagogical stage and vice versa. Teachers' strategies during an online course lead to students' learning outcomes and attitudes.

Conceptually, as for the first factor, *inclusion* guarantees that each online student shares similar feelings of togetherness, acceptability, and enjoyment. This factor encourages teachers to recognise heterogeneity, fairness, and involvement by determining either beliefs or perceptions about students' online attitudes and performance. The final goal of *inclusion* refers to equity development for all students during dynamic online classes (Martin et al., 2019). *Design* is the second factor that leads teachers to initialise online instructional activities and materials as an alignment for learning outcomes. Teachers organise a series of instruction sequences by including various resources or learning materials. Different teaching approaches require different material designs. Teachers must know what their students need and what they already know. Online teaching and learning *engagement* allow teachers to communicate with students to facilitate community building interactively (Martin & Ritzhaupt, 2023).

Unlike offline mode, online instructions are conducted to facilitate students with interactive responses, ubiquitous grading systems, and fast feedback. Teachers manage their classrooms by facilitating student-teacher and student-student discussions and monitoring their learning progress, attitude, and community building online. Instructional achievement can be consecutively determined through *evaluation* (Martin & Ritzhaupt, 2023;

'E-mentoring is an advanced teaching and learning approach that uses digital technologies and online platforms to interconnect teachers (i.e., mentors) and students (i.e., mentees). The method leads the mentor and mentee to communicate extensively via a virtual mode that prevents time, distance, and geographical barriers compared to conventional methods. The main benefit of e-mentoring refers to flexibility and accessibility'

Gaytan & McEwen, 2007). In general, *evaluation* stresses implementing various approaches and strategies to identify which knowledge has been improved and which has not. This factor enables teachers to fully acknowledge students' online performance and their feedback towards what has been given. Moreover, *assessment* measures students' achievement through both summative and formative assessments. Eventually, some prominent feedback is offered to support further learning continuity (Martin et al., 2019; Gaytan & McEwen, 2007).

2.2. What is an e-mentoring method?

The first part of this literature review describes operational definitions of e-mentoring. The term e-mentoring (i.e., electronic or digital mentoring) is defined as a supportive and systematic interaction through which a mentor gives intensive guidance, feedback, or consultation to those who need some assistance using particular digital tools, including social media, email, video conference, or learning management systems (Kumar et al., 2023; Gafni-Lachter et al., 2021). Operationally, e-mentoring consists of three subparts. First, relational interaction refers to the interaction between a mentor and mentee that extensively develops enthusiasm, transformative formation of their identities. Second, goal orientation emphasises on the interaction that encourages personal, academic, and professional skills. Third, technology-mediated communication concerns the relationship that is built through online mode (e.g., asynchronously) which is flexible in terms of place and time (Kaufman et al., 2024; Alhadlaq et al., 2019). In academic paper writing context, e-mentoring is operationalised as directed online interaction and foundation that not only concern on writing competence but also promotes students' self-regulated learning, motivation, and courage.

E-mentoring is an advanced teaching and learning approach that uses digital technologies and online platforms to interconnect teachers (i.e., mentors) and students (i.e., mentees). The method leads the mentor and mentee to communicate extensively via a virtual mode that prevents time, distance, and geographical barriers compared to conventional methods (Kaçar & Baltacı, 2023; Arnold et al., 2022; Gafni-Lachter et al., 2021). The main benefits of e-mentoring are flexibility and accessibility. Online students from distant locations can participate in every meeting without engaging in physical proximity. At the same time, teachers can reach students conveniently with both synchronous and asynchronous materials and tasks. E-

mentoring comprises particular procedures, leading teachers to set goals, conduct a discussion and task, review assignment results, and offer feedback (Kumar et al., 2023). In this case, a framework, development tracking, and schedule are needed to ensure each meeting completes its final goal.

A teacher-mentor personalises learning by utilising diverse tools and applications to facilitate student-mentee's needs, such as sharing academic papers, that develop online learning experiences (Gafni-Lachter et al., 2021). Typically, e-mentoring employs online communication tools, such as *Zoom*, emails, messaging apps, or other platforms, digitally accessed and operated by both mentor and mentee. It is noticed that a mentor selects an app based on the needs of the course, mentee, and technical barriers (e.g., internet connectivity or financial barriers). For example, a mentor may share a simple task via *WhatsApp* as it does not have to be instructed in detail. However, a complex writing task requires visual explanation (i.e., *Google Meet*) to prevent misinterpretation.

In implementing e-mentoring, a mentor determines a specific app or platform, leading to effective online interaction and progress tracking. Mentors and mentees should be comprehensively knowledgeable about communicating through online apps, which differs from traditional face-to-face meetings for many concepts and practices (Kaufman et al., 2024). The mentor needs to specify course goals, approaches for materials delivery, and assessment methods to overcome the negative impacts of the absence of physical activities. On the other side, e-mentoring remains critical for some reasons. The method lacks a personal connection between mentor-mentee and mentee-mentee, which may impact emotional prompts or affinity. Student-mentees may be entirely dependent on technology when learning other courses (Wright et al., 2024; Kaçar & Baltacı, 2023). In addition, a lack of communicative understanding cannot be avoided, as digital technologies have limitations in expressing both linguistic and paralinguistic meanings.

E-mentoring implies that students may be influenced with long-term online experience which can be both positive and negative in terms of its impact. The term online culture in e-mentoring is becoming well-known as there is an increasing number of students who depend on online learning. Online culture can be characterised as a socio-digital theory recognised in terms of technological interaction, communicative interaction, and collective distinction (Lomellini et al., 2022). Ecologically, online culture is mentioned as an interconnected environment in which individuals interact via digital platforms, codes, and modes of communication (Kaufman et al., 2024; Gafni-Lachter et al., 2021; Alhadlaq et al., 2019). Unlike traditional culture, which is managed through direct face-to-face meeting and localised rules, online culture emerges under virtual environment through which universal connectivity, advanced technology, and multimodal interaction remain central. Its positive impacts not only refer to either linguistic or symbolic system, but also platform development or online adventure that encourage individuals to be indulged, represented, and gathered in particular

'E-mentoring implies that students may be influenced with long-term online experience which can be both positive and negative in terms of its impact. The term online culture in e-mentoring is becoming well-known as there is an increasing number of students who depend on online learning. Online culture can be characterised as a socio-digital theory recognised in terms of technological interaction, communicative interaction, and collective distinction. Ecologically, online culture is mentioned as an interconnected environment in which individuals interact via digital platforms, codes, and modes of communication'

communities (Underman et al., 2022). Moreover, e-mentoring also features a type of communication that relies on wordless message. Paralinguistic communication, as the term implies, is defined as a non-verbal sign which leads to messages digitalised to formulate emotional, informational, or intentional quality between e-mentor and students (Bishop, 2021; Uştuk & Aydin, 2016). Unlike conventional face-to-face communication featuring body language or voice tone, paralinguistic factors in e-mentoring are manifested through texts (i.e., capital letter, punctuation, or ellipses), visual cues (i.e., gifs, emojis), structured options (i.e., spacing, italics, bold), or time-related aspects (i.e., response time, lengths of messages, or response speed).

Meanwhile, it is important to compare e-mentoring with other types of instructions. E-mentoring appears to be different from online tutoring or teaching regarding its focus, scope, and relation. Online tutoring focuses on task accomplishment and provides students with guidance to deal with specific learning obstacles or assignments. It is undertaken within a shorter period without any continuous or long-term objectives (Gafni-Lachter et al., 2021). Online teaching is characterised as a curriculum-driven, as it allows a teacher to instruct students with contents, a series of lessons, and multiple tasks. This type of teaching is usually in line with academic learning objectives or outcomes (Arnold et al., 2022). On the other side, e-mentoring is referred to as developmental and relationship-centred processes that emphasise on both delivering contents and guiding students with learning development, encouragement, self-confidence, and self-assurance under a particular teaching subject (Arnold et al., 2022; Alhadlaq et al., 2019). E-mentoring is undertaken for a long period during which an e-mentor control students' learning process and achievement comprehensively (Kaufman et al., 2024; Alemdag & Erdem, 2017).

2.3. Motivation and demotivation in English AW

Motivation is defined as either internal or external process of mind that encourages, direct, or guide goal-directed attitudes (Ryan & Deci, 2000). In EFL learning, motivation refers to as students' struggle and passion to study a foreign language such as English, empowered by cognitive, affective, and social needs

(Dörnyei & Ushioda, 2011). On the contrary, demotivation comprises the lack of motivation and it reduces individual's encouragement to do something. In EFL context, demotivation involves factors that intrinsically and extrinsically influence students' behaviour, struggle, and interest (Sakai & Kikuchi, 2009).

Motivation and demotivation in writing an English academic text are perceived as continuous psychological passions which may impact on students' attitude to be indulged with and persist in AW tasks. Motivation comprises the intrinsic and extrinsic factors that offer and initiate writing attitudes, while demotivation includes the lack of such factors due to negative learning experiences (Dörnyei, 2001). It is noticed that motivation and demotivation in writing an academic text constitutes two interrelated sequence that specifically affect students' involvement, determination, and achievement. While demotivation refers to the reduction of enthusiasm due to a variety of cognitive, emotional, or contextual issues (Ji & Zhang, 2025), motivation comprises both external and internal engagement that develop students to acknowledge and transform academic projects (Wang & Zhang, 2025). In the view of Self-Determination Theory (henceforth SDT), motivation becomes more important as students require independence, correlation, and skills are completed (Ryan & Deci, 2020). For instance, those who choose to write a particular theme, find it difficult to develop ideas, and obtain comments from instructors or peers usually come up with internal motivation, allowing them to encourage determination during paper writing tasks. Oppositely, demotivation appears as students fail to fulfil their needs – such as when students' tasks are strictly limiting with involvement, instructor's feedback can be negative without any support or undermining determination (Ji & Zhang, 2025; Dörnyei, 2001). In other words, instructor-student interaction is negligible (reducing achievement). Such phenomenon may lead to demotivation (Karaca & Inan, 2020), where students only find a lack of objective in retaining with writing comprehensively.

Expectancy-Value Theory (henceforth EVT) offers a new analytical insight by leading on students' beliefs regarding their possibility of success (expectancy) and the viewed noteworthiness or significance of the assignment (value) (Lyu & Salam, 2025). Motivation is empowered as students are certain that they have particular ability to achieve a qualified scholarly paper in English and when they believe that the assignment as pertinent to their academic, professional, and individual needs. Nevertheless, when students are not certain about their skills due to a lack of English proficiency or previous negative experiences, expectancy declines. In the meantime, when they view AW as irrelevant or disconnected from tangible experiences, assignment value decreases. EVT also correlates with the idea of cost, including struggle, time, or burnout included in accomplishing an assignment (Lyu & Salam, 2025). High perceived cost – such as anxiety of plagiarism negative impacts, trouble with academic requirements, or burnout from deadlines – may affect to demotivation (Karaca & Inan, 2020), even though the expectancy and value are relatively imposing (Ji & Zhang, 2025).

‘Motivation and demotivation in writing an English academic text are perceived as continuous psychological passions which may impact on students’ attitude to be indulged with and persist in AW tasks. Motivation comprises the intrinsic and extrinsic factors that offer and initiate writing attitudes, while demotivation includes the lack of such factors due to negative learning experiences. It is noticed that motivation and demotivation in writing an academic text constitutes two interrelated sequence that specifically affect students’ involvement, determination, and achievement’

If analysed together, SDT and EVT provide a supplementary description of both motivation and demotivation in AW. SDT focuses the achievement or barrier of initial psychological importance, proving how learning environment can both lead to continued involvement or disintegrate needs (Ryan & Deci, 2020). EVT, in turn, emphasises on the role of students’ cognitive assessment – expectancy, values, and cost – in showing their interest to achieve struggle in AW. Students can be internally motivated by a fascinating study topic (SDT: autonomy) but can also be demotivated as they are certain about the reduction of such writing competence (EVT: low expectancy) (Lyu & Salam, 2025). Similarly, the students can be more competent in writing an academic text (SDT: skills) but suffers from motivation then they believe on the absence of prospective advantage from the writing tasks (EVT: low value). The integration of both theories enable mentors to carefully prepare and focus on multiple factors of demotivation while concurrently empowering contexts that supporting and develop motivation (Ji & Zhang, 2025; Karaca & Inan, 2020). It can also develop the design of AW course in online learning that not only increases students’ motivation to write a text but also reduces the factors that lead them away from the writing tasks.

3. METHODS

3.1. Participants

The participants of this study consisted of thirteen university students majoring in English Education. They were selected by applying a purposive sampling method. The number of participants was based on the following consideration. First, the researcher conducted a pre-observation by enlisting either public or private universities which started to integrate e-mentoring during students’ paper writing project. Fifteen private and five public universities were identified to have lower experiences (i.e., less than two years) in utilising the mentoring method. Second, EFL students and mentors in the universities were asked to about the implementation of e-mentoring method at a glance. Third, thirteen out of twenty informed consent forms offered via email and *WhatsApp* were signed and resubmitted via *Google Form*. It indicates that seven students did not agree

with the research plan or goal. The thirteen participants represented other EFL students from both private and public universities with either motivation and demotivation issues during an AW project. Fourth, their participation selection was based on the following criteria, including: (1) being a university student majoring in English in the final semester of each grade; (2) being registered in a course that leads students to paper writing projects; (3) writing a paper to be submitted to a reputable international journal; and (4) experiencing using technology (e.g., mobile tools) as learning media.

The participants of the study comprised 38.5% doctoral, 30.8% master, and 30.8 undergraduate EFL students (Table 1) who were writing for academic publication. It is noted that although the participants were heterogenous in academic level, they also shared diverse language background. Each participant followed an IELTS writing test as a standard to determine that their language ability was of different level. Most of the students’ scores were in band 4 (53.9%), but 30.8% received band 3 and only 15.4% can achieve band 5, indicating that some of them had a good language ability, while some others had lower ability.

Meanwhile, the participants were mostly from private institution (76.9%), but those who studied English in public universities only reached 23.1%. The rationale for including these groups was that public and private universities through which the study was conducted received different experiences in terms of technology integration. Many public universities which receive yearly funds from the government have been implementing e-mentoring method to treat EFL students who write a paper for both national and international publication for years. Including more students from public universities may not result in rich data due to their higher satisfaction level in utilising e-mentoring process. However, not many private universities entirely integrate such technology for learning due to the lack of facility and funds. In fact, several universities have begun to apply the method for some years. The researcher found it interesting to investigate the use of e-mentoring in AW projects since EFL students’ limited experiences implied a tangible fact about the existence of both writing motivation and demotivation.

Several limitations were identified regarding the participant selection, including heterogenous EFL students’ level (i.e., doctoral, master, and undergraduate), higher number of students from private universities, and smaller number of participants (i.e., thirteen EFL students). Fortunately, such limitations can be anticipated by focusing on subgroup analysis and enhancing proper rationales behind each selection. It can be a considerable suggestion for future related studies to decrease the limitations through a more transformative study plan or objective.

3.2. Data collection

The data collection for this study lasted for three months, consisting of interviews in the first half month, focus group discussions (henceforth FGD) in the second half month, and a member-checking stage in the third month.

Table 1
Demographic information of the participants

	DEMOGRAPHIC VARIABLES	TOTAL	PERCENTAGE
Level	Doctoral	5	38.5%
	Master	4	30.8%
	Undergraduate	4	30.8%
Gender	Male	9	69.2%
	Female	4	30.8%
University	Public	3	23.1%
	Private	10	76.9%
Age	20-25	6	46.2%
	26-31	4	30.8%
	32-37	2	15.4%
	Above 38	1	7.7%
Language proficiency (i.e., IELTS Writing Test Score)	Band 5	2	15.4%
	Band 4	4	30.8%
	Band 3	7	53.9%

Classroom observation was conducted throughout several meetings during the e-mentoring process. The following description reveals each method.

Multiple individual interviews. Participant received and signed a consent form stating their readiness and voluntary participation during the interviews. Each session of the interviews lasted for about 60-90 minutes. The participants were entitled to determine an interview schedule or location, and they were also allowed to change the fixed schedule. The researcher informed the use of a recorder during the interviews. The participants were allowed to take a sudden break or be suspended from the interviews at their discretion. They were also informed that their recorded activity was transcribed to be used as data findings by the end of the interviews.

Focus group discussion. FGD lasted for 120 to 150 minutes, indicating that FGD involved all participants in expressing their thoughts about e-mentoring collectively. The researcher only prepared a session for FGD to consider participants' free time or the best chance to attend the forum. Each participant read and signed consent before attending whole FGD sessions. FGD began with greetings or phatic discussions that led to interrelationships among participants. On that account, the FGD was accomplished without any worse data results drawbacks. The researcher invited the participants to attend the member-checking stage if some discussion or interview transcripts required further clarification. The recorded discussion was transcribed to be combined with previous interview results.

Classroom observation. This method was intended to find out what has or has not been undertaken by either e-mentor or EFL students during e-mentoring meeting or session. The observation was conducted online and it involved several meetings that directly referred to as student-mentor activities when discussing the development of academic text. The researcher compiled observation checklists based on an analysis towards various theories. The researcher also attended a meeting through which the checklist was used. Moreover, both EFL students and mentor were introduced with the observation checklist to ensure that its content was in line their e-mentoring process.

3.3. Data analysis

The data analysis was integrated with IDEAS (Inclusion, Design, Engagement, Evaluation, Assessment, and Support) framework. The framework corresponds with EFL students' e-mentoring experiences comprehensively and has direct implication towards learning through online mode. The framework emerged as a theoretical basis for linking data and interpretation. Each data was described and critically provided with some interpretation which allowed the researcher to apply each element of the framework respectively. The absence of framework integration may lead to a lack of comprehensive and critical arguments for the data analysed.

Following five stages in analysing qualitative data from Bingham and Witkowsky (2022), the analysis began with a basic stage that resulted in searchable and organised data, ensuring

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the application of systematic processes in the following stages. The following deductive analysis stage led the researcher to align the attributed codes to study questions or purposes. This stage was conducted by sorting interview and FGD data into several categories. Such sorted data allowed the researcher to identify first impressions, write coding lists, and begin coding. Open coding emerged to be inductively analysed, leading to identifying and understanding emerging themes. The researcher developed codes, determined the main ideas based on the study purpose, and followed proofs from transcripts. The further stage was to determine different patterns for each coding process, leading to the development of themes categorised through the earlier processes (Bingham, 2023). In this stage, the researcher disclosed statements of study results by identifying systematic data (e.g., sorted coding and emerging themes) and developing thematic summaries. The final stage referred to explanations of data by acknowledging both theory and literature coding. The explanation was carefully internalised to enhance understanding and avoid misinterpretation of the results. In this case, the researcher applied the IDEEAS framework to explain and establish the literature. Meanwhile, the result of observation checklist was analysed by determining both frequency and percentages of stated activities or strategies. Frequency (F) or percentages revealed that how often an activity, strategy, or method was fulfilled by both e-mentor and students during each e-mentoring session. Such descriptive analysis was proposed to compare both qualitative results (i.e., interview and FGD analyses) and quantitative result (i.e., observation checklist). The researcher utilised SPSS 31 during the descriptive statistical analysis.

3.4. The rigour of the study

A member-checking technique was undertaken after completing all interviews and FGD sessions to consider the trustworthiness of study results. The primary rationale for using the technique was to clarify unclear utterances or vague meanings detected in the interview transcript. This technique, which lasted 10 to 20 minutes, required participants' free time and readiness to be reinvited in third-round interviews. Although not all

participants were involved, it remained challenging for the researcher to guarantee their availability and motivation for another round. Both interview time and location relied on them, proving higher flexibility and freedom.

4. RESULTS AND DISCUSSION

4.1. Motivating factors of e-mentoring integration

4.1.1. Reducing cultural and linguistic barriers

Drawbacks to engaging with rhetorical styles in writing a paper (i.e., for international publication) were increasing among students whose English remains a foreign language. For EFL students, indirect communication was of higher preference when writing paper content. It is because communication culture in the first language (henceforth L1) impacts strategies in expressing thoughts (Guo et al., 2024; Shin et al., 2019). Many EFL students suffered from this cultural barrier, which distracted the writing process. This is in line with the study of Mohammed and Al-Jaberi (2021), who believed that cultural settings impact students' writing quality and engagement. Fortunately, through e-mentoring, a mentor promoted AW development by training students to practice expressing rhetorical style online. Its effectiveness was disclosed through online tutorials, games, discussions, and feedback regarding rhetoric in an academic text. Accordingly, most EFL students agreed on the mentor's online strategies to introduce direct communication and explicit meaning required in the writing culture.

My supervisor has a better way of introducing rhetorical styles via YouTube tutorial videos, short quizzes, and online discussions with him. I have been learning writing rhetoric for three meetings and have begun to understand rhetorical processes and procedures simultaneously (P10).

At least three elements of IDEEAS framework emerged during supervisor's e-mentoring introduction, including *Inclusion*, *Design*, and *Support*. *Inclusion* and *Design*, for example, allowed him to create a proper learning environment that accommodate every EFL student with different academic or non-academic background to be involved in such an online lecture. Both elements were important as a well-designed online course leads to promising results, such as motivation improvement, cognitive development, or cultural problems (Ji & Zhang, 2025; Karaca & Inan, 2020; Dörnyei, 2001). As a positive consequence, supervisor's strategy provided valuable support for the students to encourage themselves in comprehending linguistic resources under multicultural empowerment.

Meanwhile, Table 2 reveals several strategies undertaken by the e-mentor in providing the EFL students with rhetorical styles which are important in writing an academic text. The most frequent strategy refers to e-mentor's ideas to offer the students with a variety of texts containing rhetorical models (23%). It has to be completed with clear description using interesting slides via online presentation (20%). However, the e-mentor seemed to avoid providing the students with short online videos (6%), key points of the videos (9%), and questions that reflect students' comprehension (9%).

Table 2
E-mentor's strategies in teaching rhetorical styles within academic writing

NO.	E-MENTOR'S STRATEGIES	F	%
1.	Introducing rhetorical style (narrative, descriptive, expository, argumentative) theories through shorter introductory videos.	6	17%
2.	Providing some explicit explanation with visual slides embedded in the videos for clarity.	7	20%
3.	Demonstrating academic texts focusing on rhetorical moves (i.e., thesis, claims, evidence).	8	23%
4.	Encouraging EFL students to pause the videos and take notes on key features.	5	14%
5.	Embedding reflective questions/quizzes within the videos to determine comprehension.	3	9%
6.	Providing guided practice by assigning short online tasks (i.e., identifying rhetorical style in a paragraph).	2	6%
7.	Summarising key points at the end of the videos to reinforce learning.	3	9%

AW conventions hindered EFL students from comprehensively engaging with proper paper writing. Various AW standards, such as organisation, objectivity, or details, remained unfamiliar for most students. They did not experience similar rules throughout their L1. However, Xie and Cui (2021) stated that applying to e-mentoring is a solution to promote conventions and develop competence. In this study, one of the students (P2) admitted that the mentor's idea to apply *project-based learning* (PbL) in disseminating AW conventions led to achievement for students writing. Asynchronously, the mentor tasked each student to complete a mini project regarding the writing conventions. Each student was asked to present their project online via *Zoom Meeting*. As P2 experienced:

Mini projects are paramount to developing my AW rules, but they have to be organised more appropriately when students are tasked to complete some work at their own pace. The same project was offered each week until most or even all students internalised the rules into their minds. It is not easy, but most struggle for a happy ending (P2).

One of mentor's most challenging experiences during e-mentoring instruction was that a course design should always be balanced with students' knowledge level in writing academic text. Although it is easy to determine assessment strategy, many students believed that each of them needs specific guidelines, directing them to manage self-instructed e-learning with its complexity and variety. Mentor's creativity to design a simple, but acceptable learning environment can be a tangible solution for students to adapt with scholarly writing conventions even when they do not physically meet each other. *Design* and *Assessment* are two interrelated aspects which may help an e-mentor to ensure that each student receives particular instruction under similar course design. It is because each EFL student has different academic background, linguistic competence, and e-learning experiences, stating that a mentor cannot standardise learning environment statically. Moreover, foreign language students encounter both direct and indirect barriers when writing an

academic text. Their writing motivation relies heavily on how the e-mentor configures students' learning barriers and why a particular type of assessment fits their learning needs.

It is noticed that *Design* and *Assessment* encourage EFL students' motivation to succeed on their AW projects. E-mentor's methods and strategies to design online course were mostly directed by scaffolding a writing task (20%) and utilise academic videos that contain different writing samples (16.7%). E-mentor's assessment did not include any simple task, such as a vocabulary quiz (4%) or paper review that may support students' self-evaluation process (8.3%). Interestingly, corrective feedback was completed with a specific rubric that accurately measure students' writing development (13.3%) (Table 3).

Psychological culture or habit, such as discipline, hard work, collaboration, or enthusiasm, are considered influencing factors that emerge when EFL students are challenged with writing for an international journal (Wang & Wu, 2025; Alzubi & Nazim, 2024). Although every student was determined to have such a cultural aspect, its intensity and practice differed depending on students' beliefs. Luckily, P13 experienced the benefits of e-mentoring in dealing with culture or habit.

I am a disciplined student, but I was not like this before. In e-mentoring, we were asked to enter Zoom Meetings on time. A tardy entrance results in punishment which may overcome the engagement of such a negative attitude. My supervisor always motivates me and reminds me of the importance of hard work and discipline in writing a good paper (P13).

I force myself to encourage higher discipline and enthusiasm when writing a text. Today, I do not need any command to show my positive habits, such as discipline (P3).

Self-motivation may develop self-writing discipline if students follow e-mentoring rules as if they are in an offline classroom. Writing an academic text is viewed as a complicated learning activity due to its formal and logical rules. Those who cannot adapt with AW conventions will not be able to achieve learning goals comprehensively. Fortunately, *Support* from the

Table 3
E-Mentor's design and assessment strategies in enhancing academic writing competence

NO.	E-MENTOR'S METHODS AND STRATEGIES	F	%
1.	Using instructional videos to introduce AW models	10	16.7%
2.	Offering guided writing tasks with step-by-step scaffolding	12	20%
3.	Internalising peer-review activities through online discussion	9	15%
4.	Sharing formative feedback using rubrics (i.e., content, organisation, language)	8	13.3%
5.	Designing reflective journals for EFL students to evaluate their own progress	5	8.3%
6.	Utilising plagiarism detection tools to raise awareness of academic integrity	6	10%
7.	Undertaking mini-quizzes on academic vocabulary and cohesion devices	4	6.7%
8.	Conducting collaborative projects (e.g., co-authoring short papers)	6	10%

e-mentor plays a positive role to transform students' self-motivation before higher writing discipline emerges during an AW project. Such a support does not have to be in form of physical materials or tools, but it can also be psychological in nature, such as motivation or engagement (Wang & Zhang, 2025; Karaca & Inan, 2020; Dörnyei, 2001). The students were initially trained to follow a basic type of discipline by contextualising course schedule on time. Although it seemed difficult at first, the students have successfully motivated themselves to apply new learning culture and positive habit simultaneously. The support has to contribute to students' self-determined learning motivation (Ryan & Deci, 2020), because e-mentoring is different from that in offline meeting where mentor and students are provided with face interaction and intensive communication.

Meanwhile, e-mentoring reduced EFL students' linguistic barriers in paper writing, such as syntactical structure, word choice, and coherence. As experienced by a student (P12), e-mentoring was more effective in improving his grammatical competence rather than a face-to-face meeting. E-mentoring enabled a mentor to actively provide online materials, tasks, or discussions that may lead to students' grammatical improvement in paper content. Students were allowed to text the paper supervisor when they had questions or an issue to be discussed via live meeting or asynchronous mode.

It was lucky for me to have my grammatical content corrected after I learned how to improve my grammar in a paper from non-stop exercises and tutorials by my supervisor. I was tasked to read some grammatical guidelines and complete many questions wherever I was. The supervisor never limits the schedule to collect grammar tasks (P12).

Many EFL students were challenged with grammatical problems during AW project. The e-mentor has to design an appropriate method to comprehensively evaluate what the students already acknowledged and what has not. It is noted that online *Evaluation* needs to be accurate, allowing the e-mentor to provide both score and feedback towards students' grammatical

competence in their academic text. As English grammar remains complicated for foreign language students, e-mentor's *Inclusion* that may accommodate their grammatical competence was recognised in terms of regular evaluation process. The students were motivated to complete a series of grammar test, but they also reduced writing barriers that affected on grammatical competence, including writing anxiety and learning burnout during e-mentoring session.

While conducting a live meeting, e-mentoring can be integrated with online writing apps or generative AI tools like *Grammarly*, *Quillbot*, or *Turnitin*. This strategy increased the transformative quality of e-mentoring in a writing project. A mentor directly corrected EFL students' grammar or word choice using some GenAI tools. Consequently, it led them to understand what they knew regarding some unknown parts of their papers. A mentor's explanation of such evaluation results impacted on students' cognitive development. Fong et al. (2024) emphasised that GenAI tools offer multiple innovations for students' writing improvement. Likewise, a student (P8) stated:

My paper may not contain correct grammatical sentences and proper diction. Fortunately, as the mentor provided online evaluation for paper content, I could see the results directly from Grammarly. I made many mistakes or even errors. The GenAI apps show me many corrective feedback and suggestions that I cannot attempt to reject (P8).

An *Evaluation* strategy is advantageous for EFL students who have some grammatical problems within their written text. Such an evaluation can be summative in nature, but it has also to be normative, indicating that students are not merely burdened with a final score. A proper evaluation gives more support rather than judgement. It helps students to encourage their personal enthusiasm to keep writing an academic text without any anxiety of writing failure. The continuous evaluation finally leads to AW assessment which can be accessed both synchronously and asynchronously using electronic devices, such as mobile phone.

To sum up, EFL students cannot avoid cultural and linguistic barriers once they begin writing for an international journal. Foreign language writers are mostly influenced by their L1 when writing English texts. E-mentoring potentially facilitates students' barriers by providing online tutorials, tasks, discussions, or feedback. Using mobile tools helps increase the intensity of writing discussion or task completion.

4.1.2. Promoting always-on communication

The term always-on communication is defined as either technological or pedagogical constraint where e-mentor and students interact continuously using digital platforms, such as social media or online apps. Its advantage refers to real-time interaction, communication, feedback, or knowledge transmission which can be transformed through temporary or contiguous boundary (Can et al., 2022; Alawamleh et al., 2021; Oyedemi & Kgasago, 2017). Pedagogically, its concern as a motivating factor in writing an academic text is manifested through students' learning engagement, quick e-mentor's response, and online accountability. It allows EFL students to consult writing development, discuss writing process, or receive corrective feedbacks without any time restriction of conventional classroom environment. Technologically, the communication emerges through network access, online apps, or mobile tools that constitute determined existence or communicative interaction during online setting (Reid & Ivenz, 2025; Aslan, 2021).

E-mentoring provided always-on communication between the e-mentor and EFL students. This learning approach employs various digital platforms that support both synchronous and asynchronous interaction (Lyu & Salam, 2025; Wu, 2020; Ajabshir, 2019; Oyedemi & Kgasago, 2017). With always-on communication, students, as platform users, can interact and share information without time constraints. For example, a student may submit a question to a mentor, which may be answered immediately online or later in offline. Students can therefore communicate with their mentors online based on their needs and availability. The availability of synchronous applications such as Google Meet or Zoom facilitated real-time communication. EFL students were provided with opportunities to use these applications to consult with their mentors interactively. Han et al. (2024) and Stošić and Guillén-Gámez (2024) noted that online communication tools encourage students' willingness to communicate and engage in language learning. Accordingly, live meetings enabled them to present their writing progress or discuss difficulties in paper writing with their mentor and classmates. One of the EFL students, P4, was a novice author, yet she was tasked with preparing a paper for an international journal. Similarly, although P11 was a doctoral EFL student with extensive research experience, paper writing remained demanding for them. In this respect, e-mentoring provides cyberspace communication and eliminates the need for physical meetings.

Writing a paper has become my problem since I attended a doctoral programme. I was tasked to publish two papers in both national and international journals. As I have to study at a

university far from my working campus, utilising a platform has helped me communicate with a supervisor. We always discuss my drafting problems via Google Meet in the morning or night. I am lucky because my supervisor lets me consult directly on my problems anytime (P11).

I am one of the new international journal authors on this campus. When I was tasked to write a paper, I was too lazy to reach out came very day as I no longer have face-to-face meetings anymore. The good news is that my supervisor permitted me to contact him via online platforms without any fixed schedule. Although we rely on the free version of Zoom Meeting, our communicative discussion remains effective. I can freely share what I cannot or have done in my writing because it is not in the classroom (P4).

Inclusion and Support motivated EFL students to be indulged in writing a paper for a high-impact international journal. The students may not be courageous enough to begin writing such a paper at first, but inclusive communication determined what strategy they can apply and how it implies on writing achievement. Supervisor's inclusion strategy through technology integration has been believed to be effective in reframing students' insights about paper writing. However, it has to be accomplished with some support, including course module, internet connectivity, or meeting schedule. The students are usually trapped in a situation where their writing results cannot be developed due to a lack of supervisor's control through active communication.

Asynchronous communication allowed EFL students to interact with the mentor during the AW project (Cheng & Zhang, 2024; Hsu, 2022). Although both student and mentor did not communicate within a live meeting, they can send a message (e.g., a question or case study) to the mentor without any time restriction. However, the mentor's response time cannot be decided, but the students' convenience in submitting a message remained considerable. The EFL students used several apps, such as emails, *WhatsApp*, *Moodle*, *Google Classrooms*, *Coursera*, and other discussion boards, to communicate with their mentors ubiquitously.

WhatsApp is a simple but functional platform to communicate with a mentor. Whenever I encounter a problem or question, I ask my mentor through the platform. Then, I had to wait for his feedback, which had never been too long (P1).

My academic paper supervisor prefers using email for communication. He usually responds quickly right after I text him. Our online interaction is promising as my paper is now accomplished and ready to be submitted to a high-impact journal (P9).

Students' high motivation increases whenever a supervisor welcomes paper writing discussion through online interaction. *Inclusion* remains helpful to help reach the supervisor who not only interact with students formally, but also develop the way they interact. Developing an online course design is always important for an e-mentor, because when students and teachers communicate under fast and responsive tools, they may have begun ignoring paper writing burden.

Utilising both social media and online apps in an AW project can be helpful for EFL students. The observation result in Table 4 proves that *WhatsApp* was mostly used to provide the students with some notes regarding their writing results (18.3%). It is accomplished with the use of a rubric that determines whether or not the writing result meet the stated AW

conventions (11.7%). The students preferred to receive a video or audio sent via *WhatsApp* or E-mail regarding their written feedback (16.7%). However, the e-mentor did not attempt to allow students work in group during text revision or edition using *Google Docs* (6.7%). In addition, the students did not receive any detailed corrective notes via email (8.3%).

Table 4
E-mentor's strategies in using social media/online apps for writing feedback

NO.	E-MENTOR'S METHODS AND STRATEGIES	F	%
1.	Encouraging corrective feedback through the use of WhatsApp messages/voice notes	11	18.3%
2.	Offering detailed written comments on drafts through email	5	8.3%
3.	Using Google Docs for real-time collaborative editing and comments	4	6.7%
4.	Giving sample academic texts and writing tips in WhatsApp groups	9	15%
5.	Sharing individualised rubric-based feedback through the university LMS/Google Classroom	7	11.7%
6.	Undertaking mini online conferences (via Zoom/Meet) to clarify feedback	6	10%
7.	Sharing audio/video feedback recordings sent via email or WhatsApp	10	16.7%
8.	Assigning peer feedback through WhatsApp group discussions or comment threads	8	13.3%

Advancement of mobile technologies (e.g., smartphones) led to simplicity of use and availability of feedback. Although there were many kinds of mobile learning technology, the smartphone emerged as the most popular device internalised in the teaching and learning process. Accordingly, Ebrahimi (2022) argued that mobile technology motivates EFL students due to its automatic learning assistance. The EFL students believed the smartphone is a portable, modern device that allowed them to communicate ubiquitously with a mentor. Such a mobile device has become very popular as it can be integrated with various apps (i.e., free or paid), which is ideal for supporting paper writing development. Communicating with the smart device encouraged students' motivation, reduced stress, and transformed AW methodologies among EFL students.

I admit that my smartphone has helped me to discuss with my supervisor more effectively. We have utilised many apps, such as emails, social media, and Google Meet. My paper writing has not been burdened since I can contact her for additional ideas and another point of view (P6).

The EFL students were actively involved through online *Engagement* which leads them to manage both tasks and time simultaneously. An effective e-mentor ensures that each student has full access to every e-mentoring process until they succeed on writing an academic text. Such an engagement encourages students' motivation to always share their writing problems or discuss an issue without any time or space limitation. However, it can become ineffective when e-mentor has difficulties to operate an electronic device such as a laptop or use internet as online resources.

In short, always-on communication must be enhanced in an AW project. Many EFL students are not ready for face-to-face discussions with a mentor due to a lack of understanding of the writing topics. Ubiquitous communication helps students engage with fast responses and quick feedback from the mentor or supervisor (Oyedemi & Kgasago, 2017).

4.1.3. *Relying on process rather than product*

In writing an academic text, a process-focused approach accentuates writing as an iterative, transformative work through which information is drafted, generated, revised, and reported. As the information is central to academic paper writing, it underlines writing as a competence that shapes students to develop ideas through practical and reflective activities (Rahimi, 2024; Guo et al., 2021). On the contrary, a product-focused approach stresses on the product of academic text, adherence to language accuracy, systematic rules, or final outcome without concerning more on EFL students' writing process (Townsend, 2025). The process-oriented approach relies on metacognitive instruction, cognitive involvement, or collaborative learning, such as repeated writing preparation or peer review, that determine AW as a strategy to encourage students' critical thinking or communication skills, while the product-oriented approach recognises AW as the final goal of a writing course, as it directs students to comprehend vocabulary, grammar, writing convention, or rhetorical styles (Tabari & Johnson, 2025; Zalazar, 2025).

Both process and product are paramount in academic paper writing. However, e-mentoring tended to rely heavily on process even though it did not ignore a final product. This study

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practically identified this phenomenon, as many EFL students experienced interesting and unique findings during paper writing. For example, P5 revealed that her mentor encouraged all students under the AW project to engage actively with mentoring procedures. During one or two live meetings, students were invited to share experiences, ideas, or suggestions regarding the e-mentoring method via *Google Meet*. The findings of Hsiao and

Chang (2023) and Wu et al. (2019) proved that online learning facilitates EFL students with a series of writing procedures. The mentor and students finalised a syllabus or e-mentoring procedure to be applied during the online activity.

My classmates and I were flattered when our mentor involved us in pre-class dialogue. I suggested that our e-mentoring activity empower GenAI tools to help us correct our writing. Other students preferred completing a paper within a fixed schedule. Honestly, what we are experiencing now has been previously committed earlier (P5).

Inclusion can be applied through a pre-class discussion, allowing each student to mention their needs, ideas, preferences, or writing barriers comprehensively. An e-mentor has to consider every suggestion or barrier as a rationale to design an AW course. It also motivates students and e-mentor to rely on open mind and group discussion. An effective inclusion helps an e-mentor to write a syllabus, prepare materials, or plan course evaluation and assessment.

Table 5 is in line with students' insights regarding e-mentor's inclusion during pre-class dialogue. The e-mentor focused on explaining AW course objectives and what the EFL students need to achieve (16.7%). It is important for each student to recall their knowledge about scholarly writing (13.3%). The pre-class discussion led the student to determine their final writing achievement in each meeting (13.3%). Interestingly, the e-mentor decided to motivate the students during and after the tasks were completed (8.3%).

Table 5
The steps of pre-class dialogue in academic writing course

NO.	THE STEPS OF PRE-CLASS DIALOGUE	F	%
1.	Asking warm-up questions about students' prior knowledge of the writing topic	8	13.3%
2.	Clarifying learning objectives and expected outcomes of the writing session	10	16.7%
3.	Motivating students to share difficulties or challenges faced in previous tasks	7	11.7%
4.	Using short prompts or case examples to stimulate critical thinking before writing	9	15%
5.	Asking students to set personal writing goals for the session	8	13.3%
6.	Offering mini feedback review on common errors from previous assignments	7	11.7%
7.	Undertaking Q&A sessions through chat (WhatsApp/Zoom) to clarify instructions	6	10%
8.	Encouraging students with inspirational notes before the task	5	8.3%

Writing a research paper for an international publication was not simple for most EFL students. For example, many doctoral students suffer from burnout to begin or accomplish a paper by themselves (Phyo et al., 2024; Huerta et al., 2016). E-mentoring emerged to be a satisfactory solution as they needed intensive guidance or continuous training. A paper supervisor must determine both fixed and free online writing supervision

schedules. Such a strategy reduced students' anxiety about writing complexity and encouraged their motivation to write a paper systematically.

I was delighted when my supervisor offered a particular mentoring schedule, but she permitted us to contact her anytime using email. I have never been afraid of writing a draft and conducting research as long as I have a mentor to be consulted (P7).

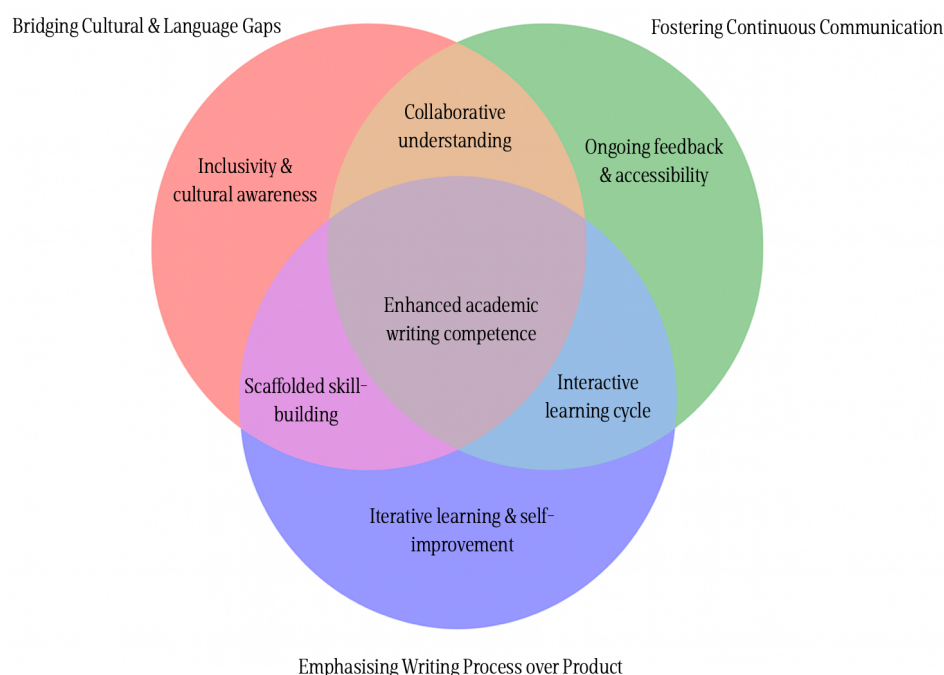


Figure 1. The motivating factors of e-mentoring integration

When students were offered flexible meeting opportunities and technology-based discussions, they became highly motivated to accomplish their planned tasks. Since academic writing requires complex skills, the e-mentor's role in providing continuous online discussion proved highly beneficial for students' success. Those facing writing difficulties were able to consult either their e-mentor or peers to find solutions to specific problems. Participation in e-mentoring was not limited to submitting a final paper to a mentor or supervisor; rather, it emphasized a comprehensive process involving the planning, drafting, and evaluation of a paper. Notably, each student received guidance before and after submission, throughout the revision stage, and during the final copyediting required by the journal.

4.2. Demotivating factors of e-mentoring integration

4.2.1. Limited on verbalisation

Although e-mentoring encouraged the emergence of effective communication between mentor and students, some drawbacks, such as lack of focus on paralinguistic communication and body language, remained problematic for a more sophisticated online interaction. Effective communication requires a combination of verbal and non-verbal indicators, enabling speakers to convey meaning (Suleyeva et al., 2021). This study showed that EFL students encountered some problems in understanding their mentor's messages both during live meetings or asynchronous mode. One of the students, P4, struggled to interpret the mentor's asynchronous description of how to write a proper literature review in a paper. Consequently, the student failed to integrate a framework into theories based on the mentor's instruction. P4 confessed:

I always believe that a mentor's intonation and body language are paramount to giving extra meaning. Mere collections of words cannot empower effective meaning. It is difficult to interpret verbal instruction as I do not know what the mentor means (P4).

While a mentor promoted knowledge through oral and visual channels, many EFL students were not able to consider any objective of such presentation. It was because online learning mode did not really offer comprehensive meaning resulted from paralinguistic element, such as body language or face mimic. In this case, a mentor needs a particular course *Design* that enables the students to fully understand what has been instructed (Kumar et al., 2023; Alemdag & Erdem, 2017). The mentor can use technology, such as online learning apps, to assess students' writing achievement and determine some feedback for their AW improvement. The *Assessment* does not have to be literally evaluative, but it should be corrective in terms of students' writing development. Utilising both synchronous and asynchronous modes may be effective to assess their written text and lead them to actively determine every e-mentoring objective.

Meanwhile, technical drawbacks, such as internet connectivity, weather problems, or crowd surroundings, increase the importance of non-verbal integration into communication (Addae et al., 2025). However, the absence of such aspects reduced students' understanding and led to misinterpretation of the given description. P9's experience regarding such technical drawbacks emerged as a good example. P9, who lives in a rural area, attended a live meeting that focused on how to write a final revision, but the internet signal was low. The impact was that some revision procedures remained unclear, leading the student to AW burnout.

'Although e-mentoring encouraged the emergence of effective communication between mentor and students, some drawbacks, such as lack of focus on paralinguistic communication and body language, remained problematic for a more sophisticated online interaction. Effective communication requires a combination of verbal and non-verbal indicators, enabling speakers to convey meaning'

I would suggest online mentoring, which allows a supervisor to not only utter words but also integrate clear body language, such as face mimics and intonation when I have internet problems (P9).

For most EFL students who did not have any full access of the internet in some rural schools, e-mentoring was believed to be much effective to learn how to write an academic text. This phenomenon is interesting since other students from urban schools found it difficult to understand what was described by a mentor. *Design* offered in e-mentoring has influenced rural students to accept technology as perfect and sophisticated media for learning AW. The rural students also considered the technology as *Engagement* tool that increases students' participation in many meetings.

In short, this drawback must be solved to help EFL students avoid misunderstandings and misinterpretations of mentors' messages or instructions. It requires stakeholders' policies and mentors' strategies to encourage the best online learning practices. Students with multicultural backgrounds can benefit from how technology visualises e-mentor's intention (Kumar et al., 2023).

4.2.2. Threats to face-to-face relationship

Affection, social and emotional learning, or empathy in face-to-face classrooms empowered teacher-student and student-student relationships. Nevertheless, e-mentoring as an online learning method distracted face-to-face relationships as offered in offline classroom meetings. Students in online classes cannot directly discuss with their classmates, and online mentors cannot directly interfere with students. Similarly, Lacombe et al. (2024) admitted that online activity (e.g., e-mentoring) leads to a lack of social boundaries. P1, for instance, only met other classmates once in two months during a paper writing project. Such an experience reduced empathy and social boundaries among the students.

I never see my classmates for one and a half months. It makes me feel alone when writing this paper. I usually asked other smart friends to help me write this or that paper sections. Now, I have to work alone as it is difficult to gather together like in earlier semesters (P1).

Although the *Engagement* of e-mentoring allows each EFL student to write an academic text on their own pace, it remains problematic for most of them who rely on group or peer work when accomplishing a task. Writing complexity should be viewed as a motivational factor for students to work under a

forum or group. Self-writing task may impact on students' unfinished text or writing development that cannot be achieved by the end of a semester. In most cases, foreign language students in Indonesia with its cultural uniqueness, not many students choose to learn alone. They tend to accomplish a task with some help from peers or others. In the meantime, an e-mentor needs to design *Inclusion* and *Assessment* process more creatively, allowing each student to not only have full access to online apps, but also to their classmates during an AW project.

Furthermore, P6 believed that writing a paper without any face-to-face contact with classmates and supervisors impacted on mental health, such as writing anxiety or burnout. Most students remained novice paper writers who need more discussion, consultation, and small talk regarding writing procedures via offline mode (Wang et al., 2024). P6 admitted that psychological burdens cannot be avoided as e-mentoring only offers online interaction.

I felt stressed when beginning to write the paper. I need a friend to talk to, but e-mentoring does not have that. Online learning cannot connect me to other classmates freely (P6).

Both *Design* and *Assessment* should be managed properly by accommodating students who cannot easily work alone during the paper writing. This problem may affect e-mentor's course objective where many students fail to write an academic text. The mentor should modify course design by asking the students to work in alone and peer or group without ignoring the quality of the writing course.

To conclude, e-mentoring should not be the only method when writing a paper. It requires additional learning situations, such as traditional classroom meetings. Teacher-supervisors should be aware of the drawbacks of overcoming continuous psychological challenges that may impact EFL students' writing success.

4.2.3. Overreliance on online culture

Online culture referred to practices, values, and attitudes that emerge from applying advanced technologies, such as the Internet. This culture derived from online users' habits or informal commitment to engage with similar behaviours when communicating online (Trinh & Dinh, 2024; Vaghjee & Vaghjee, 2022). However, this study revealed that e-mentoring yielded EFL students' overreliance on online culture due to its flexibility, ease, and comfort during online learning. Most EFL students relied heavily on digital technologies, such as *Grammarly* or *Quillbot*, to correct and improve their sentences, reducing their efforts and hard work to learn English grammar and manually paraphrase writing sources. P3, for instance, admitted:

It is very hard for me to stop using Grammarly when writing a paper for an international journal, as it automatically revises my incorrect sentences and words I was not aware of (P3).

A successful e-mentor not only helps student to get higher score, but also ensures that they do not rely on the internet resources, such as AI tools or other free published papers. Mentor's course *Design* needs to be indulged with some rules that

cannot be easily infringed by those during writing task completion. Although it may reduce students' motivation (Karaca & Inan, 2020; Dörnyei, 2001), but its effectiveness can be seen when the students are challenged with two options, including failed or successful in writing an academic text. Similarly, P8 believed that the use of *Quillbot* reduced both anxiety and stress in writing a journal paper. Native English sentences were more different from those in his L1, but a journal required a writer to submit a paper with standardised language. *Quillbot* was considered a proper app for paraphrasing every uploaded sentence. As P8 and P13 experienced, these apps encouraged them to rely on AI-driven content, which influenced both learning awareness and attempted to learn without such technology (Giray et al., 2025; Lomellini et al., 2022; Underman et al., 2022).

Quillbot indeed becomes a useful automatic paraphraser for a novice writer like me. I am worried about submitting a paper that contains manually paraphrased sentences. I cannot write any text without consulting the apps (P8).

I do not have to struggle to modify a sentence on my own. As long as advanced digital technology has Quillbot, I can always use it without limitations. Its language is always better than mine, so why not benefit from it? (P13)

Online culture can be helpful as it motivates students to use advanced technology in writing academic texts. However, it becomes harmful when they depend on tools such as AI. An e-mentor should set strict rules forbidding simple copy-and-paste use of AI output. Otherwise, EFL students may neglect their writing skills, relying on machines to complete complex tasks quickly. At the evaluation stage, the mentor may even reject a student's submission.

In summary, online culture can influence EFL writing both positively and negatively. It demands that students engage cognitively with texts, whether or not they use digital support in doing so (Lyu & Salam, 2025). Its negative effects may be mitigated through transformative learning and the development of self-reliance.

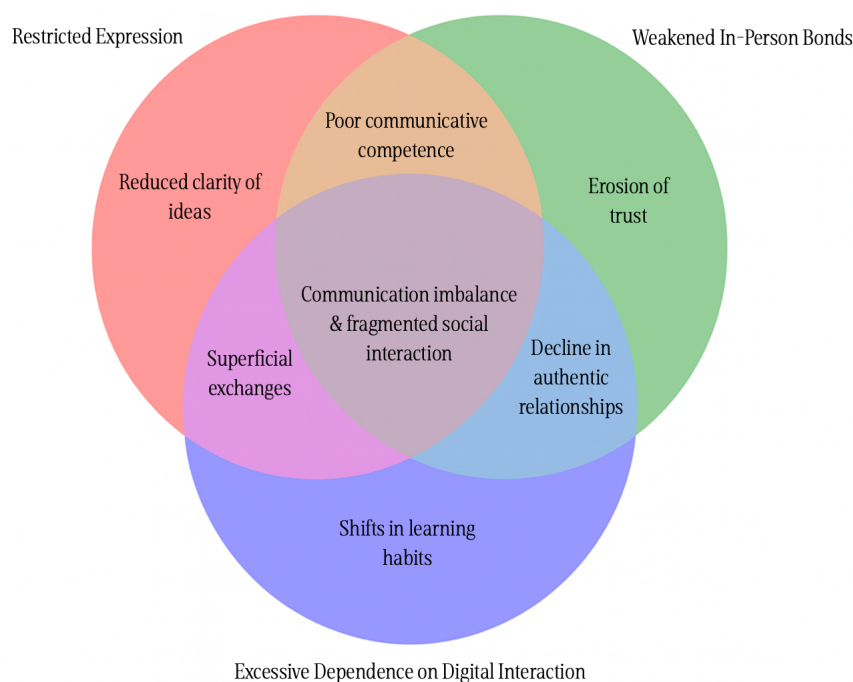


Figure 2. The demotivating factors of e-mentoring integration

5. CONCLUSION

It is critical to state that e-mentoring contributes to EFL students' motivation to write an academic text since its demotivation issues remain increasing. Motivated students rely on online cultural experiences which have not been initialised in rural academic context. Ongoing communication between e-mentor and students develops learning encouragement and prevent themselves from the pressure of academic culture, such as AW conventions. Conversely, those who deter for technology integration encounter some learning drawbacks during e-mentoring process. For instance, linguistic drawbacks, such as grammatical

competence, can be improved through oral and written communication during such online activity as it concerns on a comprehensive process rather than a mere final paper. However, although e-mentoring appears to have some drawbacks, it does not negatively lead to distractions from academic paper writing. It is because students are mostly aware that writing an academic text requires interactive supervision, which can be generally conceptualised from e-mentoring method.

The first limitation of this study refers to the number of participants selected from several universities. Future studies should involve more EFL or non-EFL students from different

levels, leading to comprehensive results. A future study may include a collaboration to reduce research burden or burnout in the field. In addition, this study recommends that university

stakeholders, mentors, or supervisors pay attention to online learning procedures, determining their proper preparation, implementation, assessment, and feedback.

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Original Research

The effects of task-based learning on English reading motivation among vocational college students

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The English language proficiency of students enrolled in vocational colleges in China has remained a significant concern for teachers and curriculum developers. Task-based learning has been put forward as a feasible approach to tackle this problem. Research on the effects of task-based learning on English reading motivation among vocational students can provide new ideas for vocational English reading education. The aim of this study is to explore the effects of task-based learning on the English reading motivation of Chinese vocational students. This study employed a mixed method approach, a quasi-experiment in phase 1 and followed by semi-structured interviews in phase 2. The population for this study comprised of vocational college students in Guizhou Province, China. Random sampling and purposive techniques were used in this study. Instruments include pretest, post-test, questionnaire, and semi-structured protocol. Data obtained from pretest and post-test was analysed descriptively, independent sample t-test, paired sample t-test and data from the interviews were analysed using thematic analysis. The average score of reading motivation for external ($M = 3.08$, $SD = 0.69$) and internal ($M = 3.20$, $SD = 0.67$) are at a low moderate level for control group and average score of reading motivation in terms of external ($M = 3.47$, $SD = 0.71$) and internal ($M = 3.56$, $SD = 0.71$) are at a low moderate level for experimental group. Two main themes emerged namely improved motivation and their critical thinking skills. The findings of this study have implications for English reading instruction and motivation for vocational college students.

KEYWORDS: English reading performance, interest, motivation, task-based learning, vocational college students

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1. INTRODUCTION

The English language proficiency of students enrolled in vocational colleges in China has remained a pressing concern for teachers and curriculum developers (Niu, 2021). Although the Ministry of Education together with the Chinese government has highlighted the significance of English language education, a multitude of provinces located at the rural areas, encompassing

Guizhou province, proceed to grapple with substantial obstacles in effectually facilitating language instruction (Hu & Zhang, 2020). Vocational students generally believe that English reading is difficult, which also leads to their low interest in English reading learning (Niu, 2021). Additionally, for non-English majors, English reading has little relevance to their major. Consequently, they neither love nor want to learn English reading

(Wu, 2020). Without the pressure of entrance examinations for vocational students, they seriously lack the motivation to learn English reading (Wu, 2020). At the same time, they do not take a keen interest in the subject. Many students view the subject as a learning task and do not want to learn English on their own (Hasan, 2014). Moreover, students in vocational colleges have a low interest in learning English reading due to their poor foundation in English reading (Wu, 2020; Guo, 2021; Niu, 2021). Guo (2021) mentioned that many vocational college students have poor English reading ability in middle school, which has significantly impacted their interest in English reading. Therefore, there is a natural resistance to English reading. Niu (2021) also believed that the unsatisfactory English reading performance of vocational students had a negative impact on their interest in reading. From their perspective, long-term English learning is boring. To maintain students' interest in English learning, it is necessary to constantly stimulate students' interest in the teaching process (Santi et al., 2021). One possible method to tackle this problem is the application of task-based learning (TBL), an effective pedagogical approach that has received rising recognition in the realm of English as a Foreign Language teaching and learning. TBL embodies student-centred approach that provides opportunities for students to engage in real-world tasks that are meaningful to encourage language learning (Hu & Zhang, 2020). This approach has been demonstrated to improve students' interest, motivation, and overall performance specifically in several language skills, comprising reading comprehension (Zhou, 2021). However, the efficiency of TBL in the setting of vocational college students in Guizhou, China, continues to be largely unexamined. This study is designed to comprehensively examine the effects of TBL on vocational college students' English reading performance, motivation and interest in Guizhou, China. The results of this research can extend meaningful insights and practical significance for teachers and curriculum developers and the broader spectrum of English language education, and vocational college students (Bao, 2023; Yang et al., 2023).

Thus, while the current landscape presents significant challenges, it also underscores opportunities for transformative educational practices that can enhance English reading comprehension among vocational college students in China, thereby contributing to their overall educational and professional development in a globalised context.

The study intends to address the following research questions.

1. What are the effects of TBL and traditional teaching methods on English reading motivation among vocational college students?
2. What are the vocational college students' views regarding the use of TBL to enhance their English reading motivation?

Research hypothesis: there are no significant differences of traditional teaching method on students' reading motivation before and after the intervention for control group and the experimental group.

2. MATERIAL AND METHODS

The study employed a mixed method research design, specifically, a quasi-experimental design, with surveys and semi-structured interviews as the research methods ensuring a comprehensive analysis of the effects of TBL. As Denscombe (2017) asserts, combining qualitative and quantitative data enables a better understanding of research phenomena, improving the robustness of the findings by capturing both statistical significance and contextual depth. This approach is supported by Creswell and Clark (2017), who emphasise that a mixed-methods design provides a comprehensive framework for addressing complex research questions and enhances the validity of the results. The research design incorporates a pretest-post-test approach to evaluate the effects of TBL on the dependent variables: English reading performance, motivation, and interest.

2.1. Participants/Subjects

The population of this research comprised from the vocational students in Guizhou province. Guizhou province is located in southwestern China, is home to 46 vocational colleges. These institutions collectively accommodate students who have completed high school or graduated from secondary school. The students enrolled in these colleges are typically between the ages of 18 and 21. This age range is particularly significant as it often coincides with transitional educational challenges, such as adjusting to higher education demands and developing specific academic skills (Li, 2021). A random sampling technique was employed to assign students to either the control or experimental groups. A total of 64 students were selected and each 32 students were assigned to the control and experimental groups. According to Zikmund (2002), probability sampling ensures that every member of the population has an equal chance of being included in the sample. This approach minimises bias and is considered robust for drawing generalisable conclusions. As for the interviews, 10 students from the experimental group were selected using the purposive sampling technique. The students were selected due to the following reasons. They were full-time, non-English major students from Guiyang Preschool Education College enrolled in a College English Reading course. First, the English reading curriculum for non-English majors in Chinese vocational colleges is highly standardised, making these students representative of the broader population of non-English majors across the nation (Hu, 2021). Weller et al. (2018) investigated saturation and sample size via 1,147 interviews, concluding that a modest sample size is enough for gathering a limited number of widely accepted concepts. Moreover, although a limited sample ($n = 10$) may include some of the most significant ideas, it might also, via meticulous probing, contain the bulk of essential notions. A sample size of ten was considered sufficient for the qualitative analysis and scope of this study (Hyrkäs, 2003). This method may be employed when specific cases or individuals are selected based on their unique characteristics or relevance to the study, but it may not always yield a representative sample (Yin, 2003).

2.2. Instruments

For the pre-test and post-test, the researcher adapted instrument from The Star Reading English reading ability assessment system, developed by Renaissance Company, represents a sophisticated, data-driven approach to measuring English reading proficiency (Yang, 2006; Yang, 2022). The questionnaire for motivation and interest based on TBL was adapted from Wigfield et al.'s (1996) measure of children's motivations for reading. A four-point Likert-type scale instrument was developed based on previous studies focusing on TBL. Each level for instance, low moderate represents mean values closer to the lower end of the moderate range (2.5-3.0). High moderate represents mean values closer to the upper end (3.1-3.5). The

researchers employed a four-point Likert scale to exclude a neutral midpoint as they sought to capture the respondents' decisive and conclusive opinions, hence precluding objectivity or contradiction. This choice prompted respondents to articulate a definitive preference, hence enhancing the accuracy of the obtained data. The descriptive analysis referring to the mean score interpretation, as outlined in the table below.

Since the researchers wanted to assess the level of motivation, they referred to the interpretation of mean scores suggested by previous expert – one of which we have included below (Table 1). Terms like low, low moderate, high moderate, and high, are the interpretations of mean scores based on our data analysis.

Table 1
Mean score interpretation

MEAN SCORE	INTERPRETATION
0.00 – 2.00	Low
2.01 – 3.00	Low Moderate
3.01 – 4.00	High Moderate
4.01 – 5.00	High

As for the semi-structured interview protocol, the researcher adapted the instrument from (Deci & Ryan, 1985) to facilitate a nuanced exploration of participants' experiences, offering a comprehensive view of how TBL influences their reading motivation and interests.

2.3. Data collection

Before the intervention, pretests were administered to both the control and experimental groups to establish baseline data. This initial data collection aims to capture the current status of the students' abilities and attitudes, providing a foundation for subsequent comparisons. The pretests and post-tests consisted of standardised English reading assessments. The questionnaires and interviews were designed to gauge students' motivation and interest in English reading and performance. The intervention in the form of TBL was implemented over a period of 10 weeks. Each week, the students in the experimental group engaged in one 40-minute TBL session, designed to enhance their English reading skills through task-oriented activities. These activities were designed to promote active learning, critical thinking, and practical application of language skills. On the other hand, the control group continued with the traditional teaching approach, which typically involves teacher-centred instruction and rote learning practices. After the 10-week intervention, post-tests were administered to both the control and experimental groups. The post-tests measured any changes in English reading performance, motivation, and interest, allowing

for a direct comparison between the experimental and control groups. The questionnaire was administered to experimental group and interviews were carried out with students from the experimental group.

2.4. Data analysis

Quantitative data from the pretests and posttests were subjected to statistical analyses to determine whether there are any significant differences between the experimental and control groups. Data obtained from the pre-test, post-tests and questionnaire were analysed using t-tests, ANOVA, and regression. Additionally, qualitative data from interviews were analysed thematically to provide deeper insights into students' motivational and interest changes. Ethical approval was sought from the research department of Guiyang Preschool Education College, and inform consent was obtained from all participants prior to the experiment and interviews.

3. THEORETICAL BACKGROUND

Current research in China predominantly focuses on applying TBL to enhance English listening and speaking skills, yet there remains a paucity of studies on its application in reading instruction. Zhengling (2022) introduced task-based teaching in senior high school English classes, evaluating its practical effectiveness and examining changes in student motivation and reading strategies pre- and post-implementation. Tang (2019) expanded TBL theories by integrating it into senior high school

English reading courses, assessing its feasibility. Zhang (2021) provided detailed strategies for applying TBL in college-level English reading courses, emphasising pre-class preview tasks, their importance, and fostering independent reading (Santi et al., 2021; Tang, 2019; Zhang, 2021). These studies contribute valuable insights into the potential of TBL to transform English language education by emphasising practical application and evaluating its impact on student learning outcomes and motivation. However, there remains a need for further research to explore the adaptation of TBL specifically in reading instruction contexts, particularly within vocational education settings.

3.1. Current state of English language instruction in vocational colleges

In the current stage of English teaching in vocational colleges, teachers face a multitude of challenges that hinder the effectiveness of language instruction. One of the primary issues is the diverse range of student backgrounds. Vocational colleges enrol both high school graduates and graduates from secondary vocational schools. High school graduates typically receive three years of systematic English education, providing them with a relatively solid foundation in the language. In contrast, students from secondary vocational schools generally have limited exposure to English courses, resulting in considerable disparities in English proficiency levels among vocational college students (Bao, 2023; Zhou, 2021).

This heterogeneity in students' English language backgrounds poses a significant challenge for teachers, who must address a wide spectrum of proficiency levels within a single classroom. This situation necessitates differentiated instruction strategies to effectively meet the needs of all students, from those with a strong command of the language to those requiring basic language support. Consequently, teachers must invest significant effort into developing and implementing tailored instructional approaches that can bridge the proficiency gap and facilitate meaningful learning experiences for all students.

Furthermore, vocational college students are generally exempt from taking the College English Test Band 4 (CET-4) and Band 6 (CET-6) exams, which are mandatory for undergraduate students in China. This exemption has implications for the students' motivation to learn English. The CET-4 and CET-6 exams serve as critical external motivators for undergraduate students, as these exams are often prerequisites for graduation and are highly valued by employers. In contrast, vocational college students are only required to pass basic end-of-year examinations in their first year, which do not carry the same level of significance or provide the same extrinsic motivation. Consequently, vocational students lack external motivators for English learning, which further exacerbates their low levels of motivation (Jiang & Husain, 2023).

3.1.1. English reading performance

English reading education stands as a pivotal component of language learning worldwide, recognised for its essential role in

developing fundamental skills such as reading comprehension, critical thinking, and overall linguistic proficiency (Smith, 2020). The landscape of English reading education has evolved significantly, reflecting diverse pedagogical approaches and educational philosophies aimed at equipping learners with the necessary tools to navigate an increasingly interconnected world. In China, where English proficiency is increasingly valued as a gateway to academic and professional opportunities, the implementation of effective reading education strategies has become paramount (Ni et al., 2022). This review explores the current trends and practices in English reading education within the Chinese context, examining how educational theories, methodologies, and technological advancements shape teaching practices and impact student outcomes. By delving into these dynamics, this review aims to illuminate the evolving strategies that educators employ to enhance students' reading abilities and foster broader language competencies in China's educational landscape (Ni et al., 2022).

In global educational contexts, English reading education plays a crucial role in enhancing students' literacy skills and cultivating a deeper understanding of texts spanning various genres and disciplines (Grabe & Stoller, 2019). Effective instructional practices encompass a range of strategies designed to foster active engagement and comprehension among learners. These include pre-reading activities that activate prior knowledge, guided reading sessions that scaffold understanding through teacher support, and post-reading discussions that encourage critical analysis and reflection (Banditvilai, 2020). Such strategies are foundational in developing students' ability to navigate complex texts and derive meaning from diverse literary and informational sources.

3.1.2. Task-based learning

TBL, which focuses on practical language use and real-world tasks, has shown promise in enhancing students' language proficiency and intrinsic motivation (Chua & Lin, 2020). These approaches not only cultivate essential language skills but also nurture critical thinking and problem-solving abilities relevant to vocational settings (Wei, 2024). In 2001, the National English Curriculum Standards (NECS) issued by the Ministry of Education advocated the implementation of TBL in English subject education. The NECS encouraged teachers to create a real situation for students English learning. TBL is a good way to achieve this purpose. In addition, the latest document issued by Ministry of Education, PRC Guidelines on college English Teaching continues to encourage the use of TBL.

TBL is a pedagogical approach grounded in the constructivist teaching model. It represents a form of collaborative learning in which instruction is driven by problem-solving and the completion of tasks (Hu, 2021). Long (1985) pointed out that language must be acquired through conversational interaction in which students complete tasks. Communicative interaction is more conducive to language understanding. Nunan (1989) proposed a design framework based on classroom communication

tasks and pointed out the implementation of networking tasks. The framework requirements should include: (1) goal; (2) input activity; (3) teacher role; (4) learner role; (5) context.

Among them Nunan (1989) mainly proposed: The goal of language communication is social communication and cultural communication. From knowledge to skills, from language to culture, this has generated a great response in the field of foreign language teaching and opened up new ideas for foreign language teaching. The real evolution of TBL into a new type of pedagogy began in 1996. The teaching framework of TBL comprised of three-stage model of TBL, namely pre-task, task cycle and post-task (Willis, 1996). This model centres on task organisation and the specific operation process of TBL. This task-based teaching model points out a clearer and more operable teaching task for the first time.

Aflah (2021) mentioned that TBL is characterised by learning in the process of doing and learning in the process of using. TBL embodies the people-oriented, student-centred and provides important methodological support for modern education reform. Moreover, Cai (2024) found that if a teacher can guide students to use what they learn in an authentic situation it will not only guarantee the English language application ability but also improve students' level of learning ability and specialty literacy. Teachers organise and carry out communicative classroom activities by providing students with different English reading tasks so as to achieve the teaching purpose of cultivating students' English reading ability in real English reading situations. Since the introduction of TBL into China, it has always been used in the practice and application of second language teaching. In class, teachers will be instructors rather than educators. They help students to complete the tasks in the teaching process (Han, 2018). However, most of current Chinese context research on the teaching method focus on speaking and comprehensive courses practice and the proportion of studies on English reading is very small (Chen & Wang, 2019). Tang (2019) believed that TBL is an imported product for China because the teaching method appeared and developed abroad. So, there are some shortcomings in the understanding, application and the implementation of TBL in the Chinese classroom (Tang, 2019). Hu (2021) also believed that TBL is developed in foreign countries and in the process of development it is inevitably affected by foreign teaching environment and conditions. How to make TBL more suitable for English education in Chinese universities has become the concern of scholars (Chen & Wang, 2019).

After more than 20 years of practice and research, TBL plays a decisive role in English teaching in China and has made a great contribution to the cause of English education. However, Wang (2021) said task-based teaching method has not been well use in current English teaching in vocational colleges. There are many shortcomings in the teaching process of most vocational college colleges. Most students in vocational colleges fail the college entrance examination or graduate from secondary vocational schools. These students have a weak foundation of study.

Lack of knowledge makes students less motivated to learn. In the practice of English reading, vocational students do not understand many words, resulting in insufficient grasp of the context, which seriously affects the students' English learning atmosphere (Wang, 2021).

2021 Chinese vocational college English Curriculum Standards emphasised that its urgent to improve students' English reading ability. The standard requires teachers to gradually de-emphasise the teaching of specialised grammar knowledge in English reading course. At the same time, teachers should let students learn in situations and topics so as to cultivate students' interest in English reading.

3.1.3. Motivation

Motivation plays a crucial role in both education and psychology, particularly in its impact on foreign language teaching and learning. It encompasses the psychological processes that initiate, direct, and sustain behaviour towards achieving specific goals (Deci & Ryan, 1985). In the context of language learning, motivation is fundamental as it influences students' initiative to engage with the language, their persistence through challenges, and their overall success in mastering English.

Motivation can be broadly categorised into two main types: external motivation and internal motivation. External motivation refers to factors outside the individual that drive behaviour, such as rewards, grades, or external pressures like societal expectations or economic incentives (Ryan & Deci, 2020). In the realm of language learning, external motivation often manifests as instrumental motivation, where learners are motivated by practical benefits such as career advancement, academic requirements, or fulfilling external expectations (Lambert, 1974). On the other hand, internal motivation involves factors that originate within the individual, such as personal goals, interests, and values. Internal motivation is closely aligned with integrative motivation, which reflects a positive attitude towards and a strong personal interest in the culture and people associated with the target language (Gardner et al., 1985). Integrative motivation encourages learners to engage deeply with the language, culture, and community associated with the language, thereby enhancing their learning experience and proficiency.

In terms of motivation, vocational college students also demonstrate a low level (Niu, 2021). Zhang (2024) emphasised that vocational college students generally display low motivation in English learning. They require teachers' questioning, assessments, and other interventions to enhance their engagement in English learning activities. Liu (2022) classified the English reading motivation of vocational students into three categories: Self-actualisation type, Obligation-fulfilment type, and Ambiguity type. Self-actualised students aspire to fulfil their self-worth through English learning. The purpose of Obligation-Fulfilment students' English learning is to achieve utilitarian goals such as earning credits or passing exams. Approximately two-thirds of vocational college students fall under this category (Liu, 2022). The final group often exhibits a negative attitude towards

English learning due to a lack of clear motivation. Zhang (2024) identified three issues regarding the English reading motivation among vocational college students: instrumental motivation (utilitarian motivation) is evident, while integrative motivation (motivation driven by interest in English and related culture) is insufficient. The learning environment is not enough to stimulate the motivation, such as a bad learning atmosphere. Learners lack confidence and self-negate their English learning. Moreover, Xu and Durgunoğlu (2019) argue that students' reading performance correlates directly with their motivation and interest in learning English. To foster greater engagement among vocational students, educators must move away from outdated teaching models and embrace innovative approaches that align with contemporary educational needs and apply them judiciously in classroom practice.

3.1.4. Past studies

Past studies have highlighted numerous factors that contributed to the problems encountered by Chinese vocational students in mastering and learning English language. In March 2021, the Ministry of Education released the English Curriculum Standards for Vocational College Education, which emphasise that improving reading proficiency not only expands knowledge and vocabulary but also enhances language comprehension skills. The promotion of comprehensive skills encompassing listening, speaking, reading, writing, and translation is instrumental in fostering enhanced English communication abilities for the future. Despite the Chinese government's significant emphasis on English education, Chinese students' proficiency remains relatively low based on the IELTS performance for the test taker report. This issue is particularly pronounced within vocational colleges (Tang & Gao, 2023). Recent studies have continued to highlight these challenges. For instance, Zhang (2023) found that despite increased resources and policy support, vocational college students still struggle with achieving high proficiency levels in English due to inadequate teaching methodologies and lack of practical language use opportunities. Similarly, Liu (2022) emphasised the need for pedagogical innovation, suggesting that TBL could address some of these deficiencies by providing more interactive and student-centred

learning experiences. Furthermore, Wang (2018) argued that aligning English education with real-world communication needs and vocational contexts could significantly improve student outcomes and engagement.

At vocational colleges specifically, the challenges in English reading comprehension are even more pronounced. Yan (2019) underscores this disparity, noting that vocational college students often face significant difficulties in grasping and interpreting written English texts. Factors contributing to these challenges include limited exposure to English language materials, varying levels of foundational English proficiency among students, and instructional methods that may not sufficiently emphasise reading comprehension skills. Moreover, the implications of these findings extend beyond academic performance alone. Proficiency in English, especially in reading comprehension, is crucial for vocational college students aiming to compete in a globalised job market where English proficiency is often a prerequisite for career advancement and international collaboration. Addressing these weaknesses becomes imperative not only for improving academic outcomes but also for enhancing vocational education's capacity to prepare students for the demands of a modern workforce.

In light of these challenges, the integration of innovative pedagogical approaches such as TBL holds promise. TBL not only addresses the cognitive aspects of learning by engaging students in meaningful tasks but also fosters language acquisition through contextualised practice, thereby potentially bolstering students' reading comprehension skills in English. By leveraging TBL's student-centred and task-driven approach, vocational colleges in China can potentially bridge the gap in English reading proficiency, thereby equipping students with essential skills for success in both academic and professional spheres.

4. STUDY RESULTS

4.1. What are the effects of TBL and traditional teaching methods on English reading motivation among vocational college students?

Table 2 shows the demographic profile of respondents who have answered the questionnaire and take the Star reading tests.

Table 2
Demographic Information

GROUP	TOTAL OF STUDENTS	GRADE	AGE RANGE	GENDER*	
				MP (%)	FP (%)
Experimental	32	First-year	18-21	29 (91)	3 (9)
Control	32	First-year	18-21	25 (78)	7 (22)

*M: Male; F: Female; P: Percentage

A total of 64 first-year students (academic year 2022–2023) from two classes at a vocational college in Guizhou Province, China, participated in the study. Their ages ranged from 18 to 21 years. Thirty-two students were assigned to the

experimental group and 32 to the control group. The experimental group comprised 91% male students ($n = 29$) and 9% female students ($n = 3$), while the control group consisted of 78% male students ($n = 25$) and 22% female students ($n = 7$).

Table 3
Students' English reading motivation

ASPECTS	CONTROL		EXPERIMENTAL	
	MEAN	STD. DEVIATION	MEAN	STD. DEVIATION
External	3.08	0.69	3.47	0.71
Internal	3.20	0.67	3.56	0.71

As is shown in Table 3, the average score of reading motivation in terms of external ($M = 3.08$, $SD = 0.69$) and internal ($M = 3.20$, $SD = 0.67$) are at a low moderate level for control group.

Meanwhile, the average score of reading motivation in terms of external ($M = 3.47$, $SD = 0.71$) and internal ($M = 3.56$, $SD = 0.71$) are at a low moderate level for experimental group.

Table 4
Students' English reading motivation in terms of external motivation for control group (post-test)

ITEM	NM	MNM	BM	MM	CM	MEAN	STD. DEVIATION	INTERPRETATION
I take initiative in English reading class.	3 (9.4%)	7 (21.9%)	19 (59.4%)	1 (3.1%)	2 (3.1%)	2.75	0.91	Low Moderate
By reading English, I can have a deeper understanding of foreign customs and human relations and broaden my horizon.	0	6 (18.8%)	20 (62.5%)	4 (12.5%)	2 (6.3%)	3.06	0.75	High Moderate
I look forward to finding out my reading grade.	0	3 (9.4%)	21 (65.6%)	5 (15.6%)	3 (9.4%)	3.25	0.76	High Moderate
In order to get good grades and win praise from my teachers and parents, I took English reading seriously.	0	5 (15.6%)	18 (56.3%)	6 (18.8%)	3 (9.4%)	3.21	0.83	High Moderate
I anticipate that engaging in English reading will enhance my comprehension of the distinctive structural characteristics inherent to various textual genres.	0	2 (6.3%)	25 (78.1%)	1 (3.1%)	4 (12.5%)	3.21	0.75	High Moderate
English reading helps me express my ideas in a more organised way.	0	5 (15.6%)	16 (50%)	6 (18.8%)	5 (15.6%)	3.34	0.93	High Moderate
By learning English reading, I hope to read English Novels and English newspapers.	0	2 (6.3%)	18 (56.3%)	8 (25%)	4 (12.5%)	2.43	0.80	Low Moderate
I hope I can use what I have learned in English reading class in my future job.	1 (3.1%)	4 (12.5%)	18 (56.3%)	6 (18.8%)	3 (9.4%)	3.18	0.89	High Moderate
I like to acquire new knowledge by reading.	0	7 (21.9%)	20 (62.5%)	2 (6.3%)	3 (9.4%)	3.03	0.82	High Moderate

Table 4

Students' English reading motivation in terms of external motivation for control group (post-test) (continued)

ITEM	NM	MNM	BM	MM	CM	MEAN	STD. DEVIATION	INTERPRE TATION
It is important for me to see my name on a list of good readers.	0	5 (15.6%)	18 (56.3%)	5 (15.6%)	4 (12.5%)	3.25	0.87	High Moderate
I like hearing the teacher say I read well.	0	6 (18.8%)	19 (59.4%)	3 (9.4%)	4 (12.5%)	3.15	0.88	High Moderate
External Motivation						3.08	0.69	High Moderate

The descriptive analysis indicates that external motivation for control group is at a high moderate level with a mean value of 3.08 and a standard deviation of 0.69. The item with the highest mean value is 'English reading helps me express my ideas in a more organised way' with a mean value of 3.34 and a standard deviation of 0.93, placing it at a high moderate level. Based on these findings, 5 individuals or 15.6% stated 'com-

pletely matched'. However, 5 individual or 15.6% stated 'mostly not matched'. Meanwhile, the item with the lowest mean value is 'By learning English reading, I hope to read English Novels and English newspapers' with a mean value of 2.43 and a standard deviation of 0.80, at a moderately low level. Based on these findings, 2 individuals or 6.3% stated 'mostly not matched'. However, 4 individual or 12.5% stated 'completely matched'.

Table 5

Students' English reading motivation in terms of external motivation for experimental group (post-test)

ITEM	NM	MNM	BM	MM	CM	MEAN	STD. DEVIATION	INTERPRE TATION
I take initiative in English reading class.	0	9 (28.1%)	15 (46.9%)	6 (18.8%)	2 (6.3%)	3.03	0.86	High Moderate
By reading English, I can have a deeper understanding of foreign customs and human relations and broaden my horizon.	0	0	15 (46.9%)	10 (31.3%)	7 (21.9%)	3.75	0.80	High Moderate
I look forward to finding out my reading grade.	0	0	21 (65.6%)	6 (18.8%)	5 (15.6%)	3.50	0.76	High Moderate
In order to get good grades and win praise from my teachers and parents, I took English reading seriously.	0	0	15 (46.9%)	7 (21.9%)	10 (31.3%)	3.84	0.88	High Moderate
I anticipate that engaging in English reading will enhance my comprehension of the distinctive structural characteristics inherent to various textual genres.	0	2 (6.3%)	19 (59.4%)	4 (12.5%)	7 (21.9%)	3.50	0.91	High Moderate
English reading helps me express my ideas in a more organised way.	0	2 (6.3%)	13 (40.6%)	6 (18.8%)	11 (34.4%)	3.81	0.99	High Moderate
By learning English reading, I hope to read English Novels and English newspapers.	9 (28.1%)	13 (40.6%)	3 (9.4%)	7 (21.9%)	0	2.25	1.10	Low Moderate
I hope I can use what I have learned in English reading class in my future job.	0	3 (9.4%)	14 (43.8%)	8 (25%)	7 (21.9%)	3.59	0.94	High Moderate

Table 5
Students' English reading motivation in terms of external motivation for experimental group (post-test) (continued)

ITEM	NM	MNM	BM	MM	CM	MEAN	STD. DEVIATION	INTERPRE TATION
I like to acquire new knowledge by reading.	0	3 (9.4%)	17 (53.1%)	8 (25%)	4 (12.5%)	3.40	0.83	High Moderate
It is important for me to see my name on a list of good readers.	0	2 (6.3%)	10 (31.3%)	11 (34.4%)	9 (28.1%)	3.84	0.91	High Moderate
I like hearing the teacher say I read well.	0	2 (6.3%)	14 (43.8%)	7 (21.9%)	9 (28.1%)	3.71	0.95	High Moderate
External Motivation						3.47	0.71	High Moderate

The descriptive analysis indicates that overall external motivation for experimental group is at a high moderate level with a mean value of 3.47 and a standard deviation of 0.71. The item with the highest mean value is 'In order to get good grades and win praise from my teachers and parents, I took English reading seriously' and 'It is important for me to see my name on a list of good readers' with a mean value of 3.84 and a standard deviation of 0.88 to 0.91, placing it at a high moderate level. The item with the lowest mean value is 'By learning English reading, I hope to read English Novels and English newspapers' with a

mean value of 2.25 and a standard deviation of 1.10, at a moderately low level. Based on these findings, 9 individuals or 28.1% stated 'not matched'. However, 7 individual or 21.9% stated 'mostly matched'.

The comparison of traditional teaching method on students' reading motivation was conducted using a paired sample t test. Before conducting the paired sample t test analysis, the researcher ensured and confirmed that the data were normally distributed and homogenous. To verify the normal distribution of the data, the researcher conducted a normality test (Table 6).

Table 6
Normality test for control group

STUDENTS' MOTIVATION	SKEWNESS		KURTOSIS	
	VALUE	SE	VALUE	SE
External Pre-Test	0.116	0.414	-0.915	0.809
External Post-Test	1.110	0.414	-0.824	0.809
Internal Pre-Test	0.278	0.414	-0.193	0.809
Internal Post-Test	-0.630	0.414	-0.583	0.809

Table 6 shows that all aspects are normally distributed with Skewness and Kurtosis values for external before intervention (Skewness = 0.116, Kurtosis = -0.915) and after intervention (Skewness = 1.110, Kurtosis = -0.824) within the range of ± 1.96 . It also shows the internal aspects are normally distributed with Skewness and Kurtosis values (Skewness = 0.278, Kurtosis = -0.193) and after intervention (Skewness = -0.630, Kurtosis = -0.583) within the range of ± 1.96 . Table 7 shows the results of the paired sample t test.

Based on the findings, there were no significant disparities observed in the external motivation of the control group following traditional teaching method intervention, with post-test results has higher mean compared to pre-test outcomes. Table 6

also shows there were significant disparities observed in the internal motivation of the control group following traditional teaching method, with post-test results has higher mean compared to pre-test outcomes. Consequently, null hypothesis 3 is accepted, indicating no significant differences of traditional teaching method on students' motivation before and after the intervention for control group.

The comparison of TBL method on students' reading motivation was conducted using a paired sample t test. Before conducting the paired sample t test analysis, the researcher ensured and confirmed that the data were normally distributed and homogenous. To verify the normal distribution of the data, the researcher conducted a normality test as presented in Table 8.

Table 7
Paired sample t-test for control group

PAIR	STUDENTS' MOTIVATION	MEAN	N	STD.	t	df	Sig.
Pair 1	External Pre-Test	2.91	32	0.70	-1.006	31	0.322
	External Post-Test	2.96	32	0.65			
Pair 2	Internal Pre-Test	2.31	32	0.63	-7.769	31	0.000
	Internal Post-Test	2.92	32	0.70			

Table 8
Normality test for experimental group

STUDENTS' MOTIVATION	SKEWNESS		KURTOSIS	
	VALUE	SE	VALUE	SE
External Pre-Test	-0.132	0.414	-0.597	0.809
External Post-Test	0.493	0.414	-0.630	0.809
Internal Pre-Test	0.155	0.414	0.074	0.809
Internal Post-Test	0.591	0.414	-0.330	0.809

Based on Table 8, all aspects are normally distributed with Skewness and Kurtosis values for external before intervention (Skewness = -0.132, Kurtosis = -0.597) and after intervention (Skewness = 0.493, Kurtosis = -0.630) within the range of ± 1.96 . It also shows the internal aspects are normally distributed with Skewness and Kurtosis values (Skewness = 0.155, Kurtosis = 0.074) and after intervention (Skewness = 0.591, Kurtosis = -0.330) within the range of ± 1.96 . Table 9 shows the results of the paired sample t test.

The analysis revealed significant disparities in both external and internal motivation for the experimental group following the TBL intervention. The post-test results in these areas demonstrated higher mean scores compared to the pre-test outcomes, indicating substantial improvements in students' motivation levels as a result of the TBL intervention. The marked rise in external motivation indicates that, under the TBL approach, students developed a stronger interest in reading, influenced by external factors such as rewards and recognition. Similarly, the significant improvement in internal motivation indicates that students experienced a boost in their intrinsic interest and engagement with reading, likely due to the more engaging and interactive nature of TBL. Consequently, null hypothesis is rejected, indicating that TBL produced significant differences in

students' motivation levels before and after the intervention. This finding underscores the effectiveness TBL in enhancing both external and internal motivation among students in the experimental group.

4.2. What are the students' views regarding the use of TBL on their reading motivation?

The researcher carried out interviews with students to explore their views of using TBL on their English reading motivation. Students shared that teacher's use of TBL in the classroom facilitated in terms of improving their motivation. Two main themes emerged namely improved motivation and their critical thinking skills.

4.2.1. Improved motivation

The students' feedback acquired through the study reveals that TBL plays a significant role in enhancing their motivation for reading. R1 indicates that having specific tasks related to new vocabulary encourages students to actively seek out and understand unfamiliar words:

'... and I'm motivated to look them up and understand their meanings' (R1).

'I feel motivated to learn English' (R2).

This intrinsic motivation to explore and learn new terms is a direct result of the task-based approach, which provides a clear and purposeful goal for students. R3 underscores the idea that having a structured objective associated with reading tasks increases students' motivation by giving them a sense of purpose and direction:

'It definitely motivates me because I know I'm working towards a goal' (R3).

'I like the way the teacher teaches, it is very interesting, I have the motivation to learn' (R4).

Furthermore, R4 statement reflects how TBL not only sets a goal for students but also fosters a sense of achievement upon completing tasks: *'It motivates me because I know that there's a purpose behind reading. Completing the tasks gives me a sense of accomplishment and helps me stay motivated' (R5).*

The satisfaction derived from reaching a goal reinforces students' motivation to engage with the reading material. The sense of accomplishment that comes from finishing a task encourages continued effort and participation, demonstrating how goal-oriented activities can drive sustained motivation (Table 10).

Table 9
Paired sample t-test for experimental group

PAIR	STUDENTS' MOTIVATION	MEAN	N	STD.	t	df	Sig.
Pair 1	External Pre-Test	2.88	32	0.63	-3.421	31	0.002
	External Post-Test	3.47	32	0.71			
Pair 2	Internal Pre-Test	2.96	32	0.66	-3.596	31	0.001
	Internal Post-Test	3.56	32	0.71			

Table 10
Themes and coding: Improved motivation

THEME	CODING	EXCERPTS/RESPONDENTS
Improved motivation	motivated to learn	<i>'and I'm motivated to look them up and understand their meanings' (R1)</i>
	motivated to learn	<i>'I feel motivated to learn English' (R2)</i>
	it definitely motivates me	<i>'It definitely motivates me because I know I'm working towards a goal' (R3)</i>
	I have the motivation	<i>'I have the motivation to learn' (R4)</i>
	it motivates me because...	<i>'It motivates me because I know that there's a purpose behind reading. Completing the tasks gives me a sense of accomplishment and helps me stay motivated' (R5)</i>

4.2.2. Improved critical thinking

The students' feedback reveals that TBL has significantly enhanced their analytical skills and their ability to synthesise and communicate information. R1 indicating that engaging with task-based activities has led to notable growth in these critical cognitive abilities:

'My analytical skills and ability to synthesise information have improved a lot' (R1).

'I am more confident when it comes to critical thinking through TBL activities' (R2).

This feedback underscores that TBL effectively develops students' skills in analysing and synthesising information from various sources. R2 statement reflecting a clear advancement in their capacity to critically evaluate and interpret information:

'Yes, I think my ability to analyse and evaluate information is more developed now' (R3).

'I am able to think deeper and I can share my thought with my friend while doing the task' (R4).

These statements highlight that TBL helps students refine their analytical skills, which are essential for effective academic

Table 11

Themes and coding: Improved critical thinking

THEME	CODING	EXCERPTS/RESPONDENTS
Improved Critical Thinking	analytical skills	'My analytical skills and ability to synthesise information have improved a lot' (R1)
	synthesise information	
	critical thinking	'I am more confident when it comes to critical thinking through TBL activities' (R2)
	ability to analyse and evaluate	'Yes, I think my ability to analyse and evaluate information is more developed now' (R3)
	able to think deeper can share thoughts	'I am able to think deeper and I can share my thought with my friend while doing the task' (R4)
		'Absolutely. I think my ability to analyse, synthesise, and communicate information has improved significantly' (R5)

and real-world problem-solving. Moreover, R3 elaborated that TBL not only enhances students' analytical skills but also improves their ability to integrate and articulate information:

'Absolutely. I think my ability to analyse, synthesise, and communicate information has improved significantly' (R5).

The development of these skills is crucial for higher-order thinking and effective communication, which are central to academic success and professional competence. The findings of this study reveal that while TBL offers various benefits, it also presents significant challenges, particularly related to tasks that demand extensive analytical skills and deep critical thinking. This aspect of TBL is crucial because it underscores how the cognitive demands of tasks can impact students' learning experiences and outcomes. The feedback from participants highlights that these rigorous tasks can sometimes be overwhelming, especially for students facing time constraints or struggling with complex cognitive processes. One major challenge identified in the study is that the analytical demands of TBL tasks can be overwhelming for students.

5. DISCUSSION

In terms of reading motivation, both the control and experimental groups showed low to moderate levels of both external and internal motivation. This suggests that vocational college students generally exhibit low levels of motivation related to their English reading practices. One major factor is the perception of English reading as a challenging and unenjoyable task. Niu (2021) reveals that many students find English reading to be demanding and do not see its value beyond fulfilling course requirements. This perception can lead to a lack of intrinsic motivation, where students engage in reading more out of necessity than personal interest or enjoyment.

For the control group, external motivation was at a low to moderate level. The item with the highest mean value was 'students hope to use what they have learned in English reading

class in their future job and like to acquire new knowledge through reading,' while the item with the lowest mean value was 'by reading English, students can gain a deeper understanding of foreign customs and human relations and broaden their horizons.' This pattern reflects a general trend where students show only a moderate level of external motivation towards their English reading activities. Law et al. (2022) highlight that students often display low motivation in English learning due to the perceived lack of relevance of the language to their immediate career needs. This low motivation can be exacerbated when students do not see a direct connection between their English reading tasks and their future job prospects. The finding that students hope to apply their learning in future jobs demonstrates a pragmatic approach to external motivation, driven by perceived tangible benefits.

For the experimental group, external motivation was also at a low to moderate level. The item with the highest mean value was 'students like hearing the teacher praise their reading performance,' while the item with the lowest mean value was 'students take initiative in English reading class.' This pattern underscores a general trend where external motivational factors are somewhat effective but still present significant challenges. Wu (2020) highlights that vocational students often lack motivation for English learning due to the absence of high-stakes exams or other external pressures that might otherwise drive their academic efforts. Without such pressures, students may find it challenging to maintain motivation.

Data from the interviews supported the survey findings. Students' feedback showed that TBL plays an important role in enhancing their motivation for reading. It was apparent that students became more motivated to look up words and comprehend their meanings. This, in turn, motivated them to learn English. The task-based approach provided opportunities for students to activate their intrinsic motivation, which indirectly encouraged them to learn new vocabulary words and gave them a

clear purpose to learn English. Students' feedback specifies that TBL significantly upsurges their motivation to read. This feedback reveals how TBL's planned, objective-driven reading tasks improve students' distinctive motivation to relate with new vocabulary and examine unacquainted terms. TBL translates reading from a passive task into an active, substantial endeavour by offering a clear and purposeful aim, motivating students to discover and understand new vocabulary. Prasansaph (2024) highlights the need of improving task design and implementation to augment the effectiveness of TBL in enabling student learning. Tian's (2024) research stresses that well-organised reading tasks not only captivate students but also induce them to examine and adapt new words. Tian (2024) declares that well-crafted reading tasks related with learning objectives may evidently increase student interest and promote language acquisition. This study's findings indicate that TBL markedly improves students' critical thinking abilities and their capacity to synthesise and express knowledge. Extensive research indicates that task-oriented techniques in TBL enhance the development of analytical skills, fostering critical thinking and problem-solving ability. Vu and Nguyen (2021) assert that TBL promotes student engagement in intricate cognitive processes via task completion, hence enhancing comprehension and analytical reasoning. Ellis (2017) contends that TBL's focus on problem-solving and real-world application aids students in honing their analytical abilities by necessitating the evaluation, synthesis, and application of material in significant situations. This viewpoint corresponds with the study's conclusions that TBL enhances students' analytical skills, which are crucial for proficient academic achievement.

Following Hu's (2021) perspective, which emphasises that while TBL was developed in foreign contexts and has been shaped by those environments, there is a pressing need to adapt it to better fit the specific conditions of English education in Chinese universities. Hu (2021) argues that TBL's foreign origins imply that its effectiveness is contingent upon careful adaptation to meet local educational needs, which includes addressing how traditional methods can sometimes fall short in motivating students. Traditional teaching methods, as noted by Hu (2021), often fail to address individual motivational needs comprehensively, which can result in only modest improvements in external motivational factors. The feedback from the study reveals that while TBL offers significant benefits for students, it also presents several challenges. These challenges include demanding tasks, repetitive tasks, restrictive tasks, and tight deadlines. One of the primary challenges identified is the demanding nature of the tasks used in TBL. Students often find these tasks to be highly challenging and requiring substantial effort, which can be overwhelming and counterproductive.

6. CONCLUSION

The study demonstrates that TBL significantly enhances students' reading motivation when compared to traditional teaching methods. This underscores the importance of integrating TBL strategies into educational practices. Teachers are

encouraged to design and implement meaningful, real-life tasks that require students to use language in practical contexts and foster collaboration among peers. Such tasks should be carefully crafted to engage students and stimulate their interest, potentially leading to the development of a regular reading habit.

To maximise the effectiveness of TBL, teachers should focus on creating diverse and captivating learning materials that challenge students and ignite their enthusiasm for reading. By incorporating a variety of texts and topics, educators can cater to different interests and learning styles, making reading an enjoyable and rewarding experience. Additionally, establishing a supportive classroom environment is crucial. Teachers should foster a setting that encourages active participation, where students feel comfortable sharing their thoughts and asking questions. Providing consistent, constructive feedback on students' reading progress is also essential for maintaining motivation.

The study's findings indicate a need for curriculum enhancements to address students' low reading proficiency and motivation effectively. Educational institutions must prioritise revising their curriculum frameworks to incorporate comprehensive reading programmes that integrate both traditional and contemporary teaching methods, such as TBL. This approach addresses existing gaps and aligns with best practices in language education, promoting a more engaging and effective learning experience. To facilitate these curriculum improvements, it is crucial to support professional development for educators. Teachers should receive ongoing training in advanced reading instruction techniques and innovative teaching strategies to stay abreast of the latest pedagogical advancements. This training will empower educators to implement effective instructional practices and adapt their teaching methods to better meet students' needs.

Based on the findings of this study, several recommendations for future research emerge, focusing on expanding and deepening our understanding of reading proficiency, motivation, and interest among vocational college students. One significant avenue for future research is to investigate the long-term effects of TBL on students' reading proficiency, motivation, and interest. While this study demonstrated immediate improvements in the experimental group's outcomes, it is crucial to explore whether these benefits are sustained over an extended period. Longitudinal studies with follow-up periods extending several months or even a year could offer valuable insights into the enduring impact of TBL interventions. This would help determine whether the improvements observed are temporary or if TBL can lead to lasting gains in students' reading skills and motivation. This mixed-method study has several relevant limitations that require attention. The 10-week intervention with 40 minutes per week is likely too short to show real changes in motivation, especially since the analysis mostly uses basic statistics. Due to the academic semester, available contact hours' time and cost constraints of the study, a longer duration and intensive interventions, preferably supported by longitudinal designs and advanced statistics, would enhance the results and give a better picture of motivational changes.

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Original Research

The role of language transfer in Arabic-speaking EFL learners' comprehension of scope ambiguity in doubly quantified sentences

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This study examines the influence of language transfer on Arabic-speaking EFL learners' understanding of quantifier scope ambiguity and the impact of their first language on resolving three types of doubly quantified sentences. Fifty English literature and applied English students from the University of Jordan participated, split into two groups: 25 with medium proficiency and 25 with advanced proficiency. A 14-item test with doubly quantified sentences and static pictures assessed how English proficiency influences comprehension of scope ambiguity across three patterns: numerical, universal, and existential quantifier sentences. Results indicated that higher proficiency participants better understood existential quantifier sentences, which are more complex. However, proficiency did not significantly affect comprehension of universal or numerical sentences. Numerical sentences were the most challenging due to ambiguity in linking numbers and objects, while universal sentences were easier due to their predictable meaning. In line with language transfer theory, the data analysis suggests that L1 syntactic structures influence the processing of doubly quantified sentences, with participants exhibiting tendencies to favour interpretations aligning with familiar L1 patterns. The study concludes that language transfer plays an important role in the accurate identification of scope ambiguity interpretations, particularly when L2 structures diverge from L1 norms, and provides recommendations for future research.

KEYWORDS: psycholinguistics, scope ambiguity, doubly quantified sentences, Arabic-speaking EFL learners, language transfer

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1. INTRODUCTION

Quantifier scope refers to the extent to which a quantifier (such as *all*, *some*, *none*, or *every*) applies within a sentence (Scontras et al., 2017). In sentences with multiple quantifiers,

their interactions can lead to different interpretations (May, 1977). Quantifier scope ambiguity occurs when a quantifier's influence within a sentence is unclear, affecting which parts it applies to (Marsden, 2024). This is important for processing and

‘Several factors contribute to the difficulty of comprehending quantifier scope ambiguity for EFL learners. Variations in grammatical structures and the lack of exposure to ambiguous sentences in English affect the development of strategies necessary to understand such ambiguities. Furthermore, proficiency in English grammar also plays a role, as learners may find it difficult to recognise grammatical signals indicating quantifier scope’

interpreting sentences with complex quantificational structures. Doubly quantified sentences use two quantifiers (e.g., *every* and *a*, or *three* and *five*) to clarify the scope and relationships between elements. This ambiguity is challenging for English as a Foreign Language (EFL) learners, especially those whose native languages differ structurally from English (Zibin et al., 2024). It leads to different interpretations arising from various potential arrangements of quantifiers, possibly influenced by their first language (L1).

An example of a sentence containing two quantifiers is *Every student has a favourite subject*. This clause can be interpreted in two different ways. On the surface reading, it means that each student has some subject they enjoy, though these subjects may differ from one student to another, which corresponds to the distributive interpretation. On the inverse reading, it means that there exists one particular subject that every student is passionate about, which corresponds to the collective interpretation.

Doubly quantified scope ambiguity arises when the order of two quantifiers (e.g., universal and existential) can lead to different interpretations. The surface reading is the one where the quantifiers are interpreted in the order they appear in the sentence. The inverse reading is the one where the quantifiers are interpreted in the reverse order (Scontras et al., 2017). According to the first interpretation, all students have a favourite subject because the quantifier *every* has a wider range and applies to the entire sentence. Thus, every student has a subject they are passionate about, and that subject may not necessarily be the same. In the second reading, the quantifier *some* takes precedence and suggests that all students are passionate about one subject in particular.

Several factors contribute to the difficulty of comprehending quantifier scope ambiguity for EFL learners. Variations in grammatical structures and the lack of exposure to ambiguous sentences in English affect the development of strategies necessary to understand such ambiguities. Furthermore, proficiency in English grammar also plays a role, as learners may find it difficult to recognise grammatical signals indicating quantifier scope (Saba & Corriveau, 2001). However, an important factor which should be explored is the influence of language transfer (Odlin, 2022). The syntactic structures and quantifier usage patterns of a learner's L1 can affect their interpretation of quantifier scope ambiguity in English. Research has explored general difficulties

in L2 quantifier scope comprehension (Chung & Shin, 2023), but there is a gap in understanding how specific L1 structures interact with English to create unique challenges for learners from different linguistic backgrounds. Thus, this study explores the ability of Arabic-speaking EFL learners to comprehend doubly quantified sentences and examines the impact of their first language on this comprehension. It aims to answer the following questions:

1. To what extent can Arabic-speaking EFL learners comprehend three patterns of doubly quantified sentences (i.e., universal quantifier sentences, existential quantifier sentences and numerical sentences)?
2. To what extent does the participants' English proficiency level affect their ability to comprehend these sentences?
3. In the light of language transfer (Odlin, 2022), to what extent does the participants' first language affect their comprehension of the three patterns of doubly quantified sentences in English?

2. THEORETICAL BACKGROUND

2.1. Language transfer effects

Language transfer, also known as language interference, describes the different ways in which a learner's L1 influences their acquisition and use of L2 (Dangzeng, 2021). This influence, as Lado (1957) theorised, can be either beneficial, accelerating learning when L1 and L2 structures align (positive transfer), or detrimental, leading to errors when they diverge (negative transfer) (Yang, 2019; Puig-Mayenco et al., 2020; Liang, 2024). The extent and nature of language transfer are governed by several factors, including the structural relationships between the languages themselves, the learner's proficiency, and their cognitive and developmental stage.

The transferability of linguistic features is a key principle. Positive transfer is facilitated by structural similarities. For example, Spanish speakers often benefit from cognates when learning English vocabulary (Kelley & Kohnert, 2012). Conversely, negative transfer often arises from structural differences, such as the tendency for Spanish speakers to omit subject pronouns in English due to the pro-drop nature of Spanish (Liceras & Díaz, 1999). Intralingual transfer, where learners misapply L2 rules, such as overgeneralising past tense forms (Pitkäranta, 2024), also contributes to the complexity of L2 learning. As Sasson et al. (2024) point out, this process involves a comparison of L1 and L2 knowledge, consciously or unconsciously adapting strategies and selectively transferring relevant L1 aspects to L2. In line with this, Zibin et al. (2024) noted that learners transfer could be restricted only to transfer relevant aspects of L1.

The relationship between the languages, often described as linguistic distance, is a critical determinant of transfer effects. Abdullaev (2021) observed that positive transfer is more likely when L1 and L2 share syntactic, phonological, or lexical properties, while negative transfer tends to arise from significant structural distance. Learner characteristics also play a crucial role.

'Importantly, language transfer is not unidirectional. Bidirectionality demonstrates that transfer can affect both L2 learning and L1 use, potentially leading to L1 attrition. Recognising the potential impact of language transfer in the theories of second language is essential. Understanding these effects can enhance language teaching by anticipating learner challenges, as well as informing how to address challenges stemming from language transfer'

Less proficient L2 learners tend to rely more heavily on their L1, leading to higher transfer rates and more frequent errors (Heydari & Bagheri, 2012). As proficiency increases, learners become more selective in their transfer, applying L1 features only when they align with L2 norms (Zibin et al., 2024). Age and cognitive development further influence these processes (Dey et al., 2024). Marinova-Todd et al. (2000, p. 26) suggest that 'older learners are more likely to maintain their L1 at a high level, whereas younger learners are more likely to switch to dominance or even monolingualism in the L2'.

Importantly, language transfer is not unidirectional. Bidirectionality demonstrates that transfer can affect both L2 learning and L1 use, potentially leading to L1 attrition (Pavlenko & Jarvis, 2002). Recognising the potential impact of language transfer in the theories of second language is essential. Understanding these effects can enhance language teaching by anticipating learner challenges, as well as informing how to address challenges stemming from language transfer (Zibin et al., 2024).

Finally, transfer is not limited to grammatical structure or scope. Syntactic transfer manifests as L1 sentence structures influencing L2 syntax. Lexical transfer involves L1 vocabulary influencing L2 (Löhr, 2022); while cognates can aid learning, false cognates can lead to confusion (Otwińska & Szeńczyk, 2019). Pragmatic transfer occurs when L1 cultural norms impact L2 communication, such as Arabic-speaking learners inappropriately overusing formal expressions in informal settings (Žegarac & Pennington, 2000).

Drawing on the above, the present study adopts language transfer theory to investigate how EFL learners process and interpret sentences with scope ambiguity arising from the interaction of multiple quantifiers. Taking into account that L1 syntactic structures can influence L2 sentence processing, as argued by prior research (Zibin et al., 2024), this study explores whether learners' native language patterns affect their ability to identify the intended meanings of doubly quantified sentences, particularly when L2 surface structures are different from L1 norms.

2.2. Previous studies

Fortuny and Payrató (2023) emphasise that linguistic ambiguity arises when an expression can be analysed in multiple ways at a given level of linguistic representation, referencing key works in the field. The study also explores the interaction between ambiguity and related phenomena such as vagueness,

reference transfer, and generality of sense, using examples to clarify these distinctions. The two researchers highlight the importance of empirical research in understanding how people process ambiguous sentences. In a recent study, Chung and Shin (2023) studied how L2 learners and L1 speakers interpret ambiguous sentences, especially those with negation and *every*. Both preferred less mentally taxing interpretations, with L2 learners favouring surface scope and L1 speakers considering context more. This suggests the need for personalised linguistic education and raises questions about cognitive processes in scope interpretation.

Scontras and Pearl (2021) investigated how children and adults resolve scope ambiguities, focusing on sentences where the meaning hinges on the order of quantifier and negation interpretations. Through computational cognitive modelling, the authors analyse truth-value judgment tasks to explore the interaction of grammatical processing and pragmatic factors. Their main finding is that pragmatic factors could be more influential than grammatical processing in explaining children's non-adult-like behaviour in resolving these ambiguities. Interestingly, the model suggests a qualitative similarity between child and adult ambiguity resolution, supporting a continuous developmental model where children do not mainly change their ambiguity resolution strategies but rather refine their application of pragmatic cues to achieve adult-like comprehension.

Furthermore, Apresjan's (2015) study focused on pragmatic factors in interpreting negation and quantifiers, revealing that both Russian and English speakers employ similar disambiguation strategies despite different syntactic structures. Lexical cues are crucial, with distinctions between verb-negated and quantifier-negated readings. In addition, Scontras et al. (2017) experimentally examine how speakers of English and Mandarin Chinese interpret doubly quantified sentences, which exhibit scope ambiguity in English but are claimed to be unambiguous in Mandarin. The study also investigates English-dominant heritage speakers of Mandarin to see how their interpretation of such sentences is affected in both languages. The authors use an acceptability-rating task with visual scenarios to assess the availability of inverse scope interpretations. They confirm that native English speakers generally allow inverse scope, while native Mandarin speakers resist it. They also found that heritage Mandarin speakers also resist inverse scope in Mandarin, suggesting a robustness to the prohibition on inverse scope, even when English is the dominant language. However, these heritage speakers show higher ratings for inverse scope compared to native Mandarin speakers. Interestingly, the English of these heritage Mandarin speakers also shows a resistance to inverse scope, leading the authors to suggest that heritage speakers may adopt a simpler, less ambiguous system for scope calculation. This study suggests that linguistic background influences ambiguity resolution (Kurtzman, & MacDonald, 1993).

Setiawan's (2014) research on ambiguity in EFL writing among 66 students showed that ambiguity leads to misunderstandings, advocating for educational strategies to enhance

clarity. Kim's (2010) study on Korean EFL learners and native English speakers interpreting scope ambiguity showed that native speakers varied in interpretations, while EFL learners favoured broader scope readings, highlighting L1 transfer's influence on comprehension. In similar vein, Lee (2009) examined how native Korean speakers, native English speakers, and Korean-speaking L2 learners comprehend scope ambiguity. Results indicated that native Koreans negated the entire set, while English speakers' preferences varied, emphasising the role of language proficiency in comprehension.

Zhou (2008) criticised conventional methods on semantic scope, advocating for a broader understanding that includes all plausible interpretations. Using corpus analysis on negation-quantifier scope ambiguity, the study revealed more interpretations than expected and a significant correlation between common out-of-context phrases and corpus data prevalence. These findings stress the importance of acknowledging ambiguity and interpretation variability in semantic analyses, providing insights for language processing and theoretical linguistics.

Paterson et al. (2008) examined processing quantifier scope ambiguity, like in *Kelly showed a photo to each critic*, using eye-tracking technology to assess how grammatical roles, phrase order, and lexical features influence comprehension. Results demonstrated that these factors interact complexly, complicating sentence understanding. This research contributes to theories about processing difficulties and enhances our understanding of cognitive processes and language comprehension models.

Westerståhl's (2007) study questions the notion that scope ambiguities arise solely from structural ambiguities in language, suggesting they may stem from the sentences' inherent structures. Through examining quantifier scope, he explores meaning understanding and the principle of compositionality, which posits that complex meanings derive from simpler components (Altakhaineh, 2022). Westerståhl (2007) introduces 'relational semantics', acknowledging multiple meanings for phrases and words, aiming to refine compositionality while preserving its strengths. His findings promote a nuanced view of linguistic meaning that embraces complexity.

Villalta (2003) examines real-time resolution of quantifier scope ambiguities in *how many* questions with universally quantified subjects in English and French. Using self-paced reading tests and questionnaires, the study reveals that participants' scope preferences often contradict economy-based models due to contextual influences. It shows that context can delay the resolution of structural ambiguities, and comparisons between English and French demonstrate cross-linguistic processing variations, enhancing our understanding of semantic mechanisms and the role of context in semantic processing.

The current study on Arabic-speaking EFL learners' understanding of scope ambiguity in doubly quantified phrases differs from past research. Earlier studies examined types of ambiguity across various contexts and demographics, but this research specifically addresses how Arabic-speaking EFL learners comprehend quantifier scope ambiguity in English. Unlike previous

studies that focused on written texts (Setiawan, 2014) or compared different language groups (Kim, 2010; Scontras et al., 2017), this study targets a specific learner community facing unique linguistic challenges. It uses visual stimuli to explore learners' understanding of three types of scope ambiguity and their difficulties in distinguishing between surface and inverse readings. Additionally, while other research has looked at L1 transfer's role in resolving ambiguities (Kim, 2010; Zibin et al., 2024), this study considers L1 effects in a foreign language context and offers insights for language education which are specific for Arabic-speaking EFL learners, contrasting with studies that only address theoretical implications (Westerståhl, 2007; Zhou, 2008).

3. MATERIAL AND METHODS

3.1. Participants

The study's participants were chosen purposively from among University of Jordan students, with a focus on those enrolled in programmes in English Literature and Applied English (Altakhaineh et al., 2024). We ensured that none of the participants is a native speaker of English, has a native speaker parent or lived in an English-speaking country for more than 6 months. The sample consist of 50 students (native speakers of Jordanian Arabic) in total, who were split into two groups according to their levels of English proficiency: 25 students with medium proficiency (GPA 3-3.5) and 25 students with advanced proficiency (GPA 3.6-4).

For the purposes of this study, English proficiency was determined based on Grade Point Average (GPA): 25 students with medium proficiency (GPA 3.0-3.5) and 25 students with advanced proficiency (GPA 3.6-4.0). We recognise that GPA, although it is available and indicative of overall academic success within English-related programmes at the University of Jordan, is not a direct or comprehensive measure of specific language skills such as grammar, speaking, reading, or listening. Ideally, standardised language proficiency tests like TOEFL, IELTS, or assessments in line with the Common European Framework of Reference (CEFR) provide more validated measures. However, using such tests would have increased the complexity of this initial investigation. Therefore, GPA was used as a practical and accessible proxy for overall English language competence within the context of the University's academic framework. We still acknowledge that this is as a limitation.

Since the nature of quantifier scope ambiguity necessitates a comprehension of English grammar to generate meaningful results, students with lesser levels of English proficiency were excluded from the study (Zibin, 2016). All participants were informed of the study's general goals and methods, and participation was entirely voluntary. This research project was approved by the Graduate Studies and Research Committee at the Department of English Language and Literature, the University of Jordan on 4/12/2024 Each participant gave their informed consent after being made fully aware of their rights, which included the freedom to discontinue participation at any time without

facing any repercussions. All data was collected and kept private in accordance with ethical guidelines. All publications and reports contained anonymised identifiable information. This strategy made sure that the participants' rights and privacy were respected, adhering to the ethical standards set forth for studies involving human participants.

3.2. Materials and procedures

The test comprised 14 items aimed at investigating participants' understanding of scope ambiguity. These items were categorised as follows: 4 items featuring the existential quantifier sentences where *every* positioned in the middle of the sentence, 4 items with the universal quantifier located at the beginning of the sentence, 4 items involving numerical expressions,

and 2 distractor items. The inclusion of distractors was to enhance the validity of the assessment. See Table 1 which presents the three types of scope ambiguity used in this study together with their two readings. This approach ensured that participants' responses reflected genuine understanding rather than random guessing.

Most static images for the test items were sourced from established linguistic resources, including The Scope Fieldwork Project (2008). Additionally, the researchers personally designed the images representing numerical sentences and distractors to ensure alignment with the specific goals of the study. The entire test, including all items and corresponding images, is included in the appendices for reference and replication purposes.

Table 1

The three types of scope ambiguity used in this study together with their two readings

SENTENCE PATTERN	QUANTIFIER TYPE	EXAMPLE SENTENCE	SURFACE READING	INVERSE READING
Universal Quantifier Sentences	A universal quantifier followed by an existential quantifier	Every man is sitting against a barrel	Each man is sitting against a specific barrel (distributive)	There exists a barrel such that all men are sitting against it (collective)
Existential Quantifier Sentences	An existential quantifier is followed by a universal quantifier	A shark attacked every pirate	There is one specific shark that attacked all the pirates (collective)	For every pirate, there was a (possibly different) shark that attacked them (distributive)
Numerical Sentence	Numerical (two)	Two architects built three houses	Two architects collectively built three houses (collective)	Two architects each built three different houses (distributive)

The examples illustrate that the most direct, or surface, interpretation follows the order in which the quantifiers appear in the sentence (Scontras et al., 2017). In sentences beginning with *every*, this often results in a distributive reading, where the universal quantifier applies to each individual element. In sentences where *a/an/one* precedes *every*, the surface reading, following the order of quantifiers, typically results in a collective interpretation, suggesting a single entity acting upon or related to all members of a group (e.g., *A shark attacked every pirate* implies one shark attacked all pirates). In sentences using numerical quantifiers, the surface reading frequently leads to a collective interpretation, where the numbers refer to a group acting as a whole. The inverse reading then offers an alternative interpretation where the scope relationships between the quantifiers are reversed, leading to a different understanding of the sentence's meaning (Philipp & Zimmermann, 2020).

The purpose of the study's test is to evaluate how well Arabic-speaking EFL students understand quantifier scope ambiguity in English. Quantifiers like *every* and numerical terms, which are known to generate scope issues, are used in a variety of sentence constructions. Depending on how the quantifiers are processed, each sentence is built to allow for both surface and in-

verse readings. For instance, universal quantifier sentences and existential quantifier sentences are designed to test participants' comprehension of the surface interpretation or the inverse reading. Numerical quantifier sentences, such as *two students read three books*, allow for the evaluation of participants' capacity to differentiate between interpretations that attribute the number to the books or the students.

3.3. Test Implementation

Participants took the test at the University of Jordan after receiving explicit instructions before starting. In order to make it visually appealing and easy to use, it was printed on coloured paper, which may help participants stay focused. The students participated in the test across two separate sessions to ensure focus and manageability. Each session was designed to last 30-45 minutes, providing sufficient time for students to complete the test. This structure allowed for a comprehensive assessment while maintaining a good testing environment.

To test students' ability to resolve scope ambiguity, study participants were provided with a test that includes sentence-picture pairings and three illustrations and one *I don't know* option: the first illustration matches the inverse reading

(distributive), the second matches the surface interpretation of the sentence, and the third is an illustration that matches none of the readings. The students had to choose the two illustrations

that represented the surface and inverse readings of the sentence containing the scope ambiguity, which were shuffled in the test (Figure 1).

Choose the two pictures that provide illustrations of the two possible readings of the sentence *A shark attacked every pirate*



Figure 1. An example of a test item

The two illustrations correspond to the two possible readings. Under the inverse reading, the sentence is understood as *for every pirate, there is a shark that attacked them*, which allows for the possibility that each pirate was attacked by a different shark. Under the surface reading, the meaning is *there is one specific shark that attacked all of the pirates*, reflecting the syntactic order of *a* before *every* (Scontras et al., 2017, p. 1). A third illustration represents a scenario that does not match either of these readings. In addition, a fourth option is included in order to reduce the likelihood of an incorrect choice by 25% (Zibin, 2016).

Prior to administering the entire test, a pilot test that included 5 participants (different from the ones who actually took the test at the end) was carried out. Some elements were

changed in response to the feedback in order to make instructions more explicit and guarantee that the pictures accurately matched the surface and inverse readings without any further ambiguity. This pilot stage made that the final test measured the things it was supposed to measure.

3.4. Data analysis

With an emphasis on sentence types and competence levels, the data analysis sought to evaluate Arabic-speaking EFL learners' understanding of quantifier scope ambiguity in English. Using SPSS, statistical analyses were performed to assess test reliability, item discrimination and difficulty, and significant differences across proficiency groups as described in Table 2.

Table 2
Test aspects and statistical measurements

TEST ASPECT	STATISTICAL MEASUREMENT
Reliability	Cronbach's Alpha
Item Difficulty	Difficulty Index (percentage of correct responses)
Item Discrimination	Discrimination Index
Comparative Analysis	Independent Samples t-test
Quantifier Type Analysis	Analysis of Variance (ANOVA) (if applicable)
Descriptive Statistics	Mean, Standard Deviation

The test consisted of 28 marks, with each question worth a maximum of 2 marks. A mark was awarded for selecting the correct answer reflecting the inverse reading and another for identifying the surface reading. Students who correctly identified both received full marks.

Participants' responses were categorised in an Excel sheet based on their comprehension of the target quantifier scope as inverse or literal. Inverse readings scored 1, and literal readings

scored 0; distractor options were excluded. Data analysis was performed using SPSS version 21, focusing on key factors outlined in Table 2.

The first phase involved calculating internal consistency values using Cronbach's Alpha to evaluate the test's reliability, with a score above 0.7 considered good. The second phase assessed item difficulty, calculated as the number of correct answers divided by total responses, yielding scores from 0% to

100%. Approximately half of the participants correctly answered items with a 50% difficulty score. Scores near 100% indicate ease, while scores close to zero suggest high difficulty. The discrimination index was computed to evaluate each item's ability to distinguish between high and low performers. Negative values indicate potential bias, while positive values suggest successful differentiation, with values near 0 indicating poor differentiation. The final analysis stage used an independent samples t-test to assess significant differences in participants' interpretations of quantifier scope based on proficiency levels. The t-test examined comprehension differences across proficiency groups for each sentence type.

Table 3
Reliability results

SENTENCE TYPE	CRONBACH'S ALPHA
Universal quantifier sentences	0.74
Existential quantifier sentences	0.71
Numerical Sentences	0.69
Overall Reliability	0.71

Participants' interpretation of phrases with quantifiers at the beginning has a moderate to high internal consistency, with an Alpha value of 0.74. Comparable degrees of consistency are also shown by the Alpha rating of 0.71 for sentences containing quantifiers in the middle. Although participants found numerical sentences difficult (0.69), their answers were generally consistent across questions, as indicated by the somewhat lower but still acceptable Cronbach's Alpha for these sentences. With a Cronbach's Alpha of 0.71, the test's overall reliability shows that participants consistently understood the scope of quantifiers in a variety of phrase patterns, with a high degree of consistency in universal quantifier sentences.

Table 4
The test difficulty and discrimination results

SENTENCE TYPE	DIFFICULTY (MEAN SCORES)	DISCRIMINATION INDEX
Existential quantifier sentences	1.50 – 1.64	Moderate
Universal quantifier sentences	1.72 – 1.90	High
Numerical Sentences	1.32 – 1.50	Low

Table 4 reveals the difficulty test value, indicating the percentage of participants who correctly answered each item varied by text type. The difficulty and discrimination results are: *Mean Score 1.32-1.50 (Numerical Sentences)*. Moderate to High Difficulty, with an estimated accuracy range of 32%-50%. *Mean Score 1.50-1.64 (Existential quantifier sentences)*. Moderate Difficulty, with an estimated accuracy range of 50%-64%. *Mean Score*

Five key elements were necessary to calculate the t-value: Significance Level ($\alpha = 0.05$), Degrees of Freedom ($df = n_1 + n_2 - 2$), Standard Error (SE), and the Null Hypothesis (H_0), which posits no significant comprehension difference between groups for each quantifier scope. The t-value was determined by dividing the mean difference by the standard error and comparing it to the critical value from the t-distribution table for a two-tailed test.

3.4.1. Reliability analysis

Table 3 displays the Cronbach's Alpha values for each type of sentence as well as the total values.

These results imply that the test successfully assessed participants' understanding of quantifier scope ambiguity, especially universal quantifier sentences, which is consistent with participants' propensity to find this structure easier to understand.

3.4.2. Difficulty analysis

With values ranging from 0% to 100%, difficulty was determined by dividing the number of right answers by the total number of questions for each type of text. Moderate difficulty is indicated by a value close to 50%, severe difficulty by a value close to zero, and simpler comprehension by a value close to 100% as shown in Table 4.

1.72-1.90 (Universal quantifier sentences). Low Difficulty (relatively easy), with an estimated accuracy range of 72%-90%.

Comprehension varied by sentence type, with difficulty scores from 1.32 to 1.90. Universal quantifier sentences were easier, scoring 1.72 to 1.90, likely due to their predictability. Conversely, numerical sentences had the lowest mean difficulty scores (1.32 to 1.50) due to their higher cognitive demands.

Existential quantifier sentences showed moderate discrimination (1.50–1.64), distinguishing between high- and low-performing groups. Those proficient in the language comprehended universal quantifier sentences better, while even skilled participants struggled with numerical sentences, likely due to complex quantifier interactions. In numerical contexts, the surface reading reflects a collective interpretation, contrasting with the distributive opposite seen in sentences with the universal quantifier.

Table 5
Descriptive statistics for participants' responses across three types of scope ambiguity

SCOPE AMBIGUITY TYPES	MEAN		STD. DEVIATION
	STATISTIC	STD. ERROR	STATISTIC
A) Existential quantifier sentence. Qa1	1.52	0.08	0.58
A) Existential quantifier sentence. Qa2	1.64	0.08	0.56
A) Existential quantifier sentence. Qa3	1.50	0.08	0.54
A) Existential quantifier sentence. Qa4	1.50	0.08	0.58
B) Universal quantifier sentence. Qb1	1.72	0.06	0.45
B) Universal quantifier sentence. Qb2	1.90	0.05	0.36
B) Universal quantifier sentence. Qb3	1.86	0.06	0.41
B) Universal quantifier sentence. Qb4	1.78	0.07	0.47
C) Numerical sentence Q c1	1.42	0.07	0.50
C) Numerical sentence Q c2	1.50	0.07	0.51
C) Numerical sentence Q c3	1.32	0.07	0.51
C) Numerical sentence Q c4	1.50	0.07	0.51
total_a	6.16	0.16	1.13
total_b	7.26	0.16	1.14
total_c	5.74	0.23	1.61
Total	19.16	0.34	2.38

The descriptive statistics in Table 5 shows that the lowest mean scores were obtained on numerical sentences (total_c) with a mean of 5.74, followed by existential quantifier sentences ($m=6.16$), and finally universal quantifier sentences ($m=7.26$). This suggests the numerical sentences were the most challenging for the participants, while those containing *every* initially were the least challenging, which provides an answer to the first research question. This highlights the challenges associated with comprehending different types of sentences containing scope ambiguity.

4. RESULTS AND DISCUSSION

4.1. Comprehending the three types of sentence patterns in scope ambiguity

This section aims to provide answers to the first research question which is concerned with the extent to which Arabic-speaking EFL learners can comprehend three patterns of doubly quantified sentences. Starting with descriptive analysis, Table 5 presents the means and standard deviation for participants' responses across the three types of scope ambiguity.

4.2. The effect of English proficiency level on comprehending scope ambiguity

To determine whether the participants' English proficiency level affected their comprehension of the three types of scope ambiguity and whether the differences between the participants' answers on the three types were statistically significant, a t-test was used (second research question). Table 6 displays the means, standard deviations, and t-test results comparing participants with medium proficiency (M) and high proficiency (H) in English for different sentence types (total_a for existential

quantifier sentences, total_b for universal quantifier sentences, and total_c for numerical sentences). Table 6 shows that the differences between participants' answers with medium and high proficiency levels on existential quantifier sentences are statistically significant in favour of those with high proficiency levels

(p value=0.000). However, the differences between the participants' answers with H and M proficiency levels on universal quantifier sentences (total-b) and numerical sentences (total-c) are not statistically significant (p values=0.356 and 0.699), respectively.

Table 6

Impact of English proficiency level on comprehension of scope ambiguity

GP	N	MEAN	STD. DEVIATION	STD. ERROR MEAN	T-VALUE	P-VALUE
total_a M	26	5.62	1.023	0.201	-4.066	0.000
total_a H	24	6.75	0.944	0.193		
total_b M	26	7.12	1.306	0.256	-0.933	0.356
total_b H	24	7.42	0.929	0.190		
total_c M	26	5.65	1.495	0.293	-0.389	0.699
total_c H	24	5.83	1.761	0.359		

Existential quantifier sentences were more challenging, particularly for medium-proficiency participants, as reflected in the significant difference in scores between the two groups ($p = 0.000$). The syntactic complexity and ambiguity inherent in these structures likely require a higher level of English proficiency to resolve effectively. However, interestingly, inverse readings – where each individual entity is considered separately – may be relatively easier for medium-proficiency learners than surface readings. This is because the inverse reading in existential quantifier sentences follows their L1 processing patterns and is supported by clearer, distributive cues in the sentence structure and pictures. For example, an existential quantifier sentence from the test, with both surface and inverse interpretations, is shown below alongside the associated pictures.

Surface reading: *A bird is perched in every tree.* There exists a single bird such that it is perched in every tree/branch of the same tree. This interpretation follows the order in which the quantifiers appear in the sentence, where *a bird* is considered as a single entity that somehow relates to all the trees. As shown in Figure 2, this reading depicts one bird present in all trees, requiring the listener to imagine a scenario where one bird can be in multiple locations.

This appears to be straightforward, but this reading might be less intuitive for Arabic speakers because it does not directly map onto common sentence structures. In Arabic, expressing this collective meaning might require a more complex construction, rather than a simple sentence beginning with an indefinite noun.



Figure 2. A test item showing the surface reading of an existential quantifier sentence: *A bird is perched in every tree*

Inverse reading: *A bird is perched in every tree.* Each tree has a unique bird perched on it (Figure 3). This reinterpretation requires participants to understand that a new bird is introduced for each tree shown, reversing the scope of the existential quantifier. This distributive reading can be in line with some possible Arabic translations, such as 'طائر يقف على كل شجرة' or the Jordanian Arabic equivalent 'عصفور واقف على كل شجرة', which directly translates

to *a bird stands on every tree.* However, even with this direct correspondence at face value, the interpretation can still be influenced by how quantifiers and scope are processed in Arabic, where other sentence constructions or contextual cues might be preferred to convey this meaning unambiguously. This challenges medium-proficiency learners, due to the potential influence of L1 processing habits (Wu & Ionin, 2022).



Figure 3. A test item showing the inverse reading of an existential quantifier sentence: *A bird is perched in every tree*

An existential quantifier sentence introduces ambiguity by complicating the relationship between the subject and object, demanding syntactic flexibility that is more pronounced in high-proficiency participants.

For sentences in total_b, universal quantifier sentences, the mean score for participants with medium proficiency was 7.12, compared to 7.42 for those with high proficiency. Although the mean for high proficiency participants was slightly higher, this difference was not statistically significant, as indicated by the p-value of 0.356. This suggests that both proficiency levels were similarly effective in interpreting these types of sentences, likely due to the simpler structure when *every* appears initially, which

reduces ambiguity and makes the sentences easier to process for participants across both groups. This suggests that structural simplicity reduced ambiguity, facilitating understanding for both groups (Wu & Ionin, 2022). An example of a sentence from the test with *every* initially with both surface and inverse readings with the pictures used on the test is provided below.

Surface reading: *Every man is sitting against a barrel.* The interpretation where each man sits against his own barrel agree with Arabic syntax, which typically presents quantifiers in a direct one-to-one relationship (e.g., 'كل رجل يجلس بجانب برميل' or in Jordanian Arabic 'كل زلة قاعد جنب برميل'). This facilitates easier comprehension for Arabic-speaking learners, as shown in Figure 4



Figure 4. A test item showing the surface reading of a universal quantifier sentence: *Every man is sitting against a barrel*

Inverse reading: *All men are sitting against one barrel.* All men are sitting against the same barrel as shown in Figure 5. The broader scope of *every* requires syntactic restructuring, which is less intuitive in Arabic. While this kind of scenarios are rare in Arabic, learners could express this with explicit markers, e.g., 'كل الرجال يجلسون بجانب برميل واحد' Or in Jordanian Arabic 'كل الزلمة قاعدين جنب برميل واحد'. In general, it could be argued that the structural clarity of sentences with *every* at the beginning compared to

existential quantifier sentences minimised L1 interference, making them more accessible to participants across proficiency levels. That is, a clear position for the quantifier, such as *every man is sitting against one barrel*, conveys the relationship between the subjects and objects. This clarity may help prevent learners from misinterpreting the sentence due to differences in quantifier usage or sentence structure in their native language (Julaika et al., 2025).



Figure 5. A test item showing the inverse reading of a universal quantifier sentence: *Every man is sitting against a barrel*

In the case of total_c (numerical sentences), the mean scores were 5.65 for medium proficiency and 5.83 for high proficiency. Again, participants with high proficiency scored slightly higher, but the difference was not significant statistically, with a p-value of 0.699. This indicates that proficiency did not play an important role in the comprehension of numerical sentences, suggesting that factors beyond linguistic proficiency may be at play. Further investigation could explore the specific cognitive challenges these sentence structures pose

for L2 learners (Demir, 2020). An example of a sentence from the test with numbers with both surface and inverse readings with the pictures used on the test is provided below.

Surface reading: *Two architects built three houses*, interpreted as a collective action. Arabic's preference for explicit numerical relationships (e.g., 'مهندسان بنوا ثلاثة بيوت') or in Jordanian Arabic 'مهندسين بنوا ثلاث بيوت' supports this reading, as shown in Figure 6. As discussed previously, in these sentences, the surface reading is the collective one, while the inverse is the distributive one.



Figure 6. A test item showing the surface reading of a sentence containing numbers: *Two architects built three houses*

Inverse reading: *Each architect built three houses*, involving separate pairs. Two architects each built three different houses. In Arabic, this might require explicit clarification (e.g., 'مهندسان بنی، (کل واحد منهما ثلاثة بيوت' or in Jordanian Arabic 'مهندسين بنى كل واحد منهم ثلاث بيوت', highlighting the difficulty in processing such distributions

without clear linguistic cues, as shown in Figure 7. That is, without overt linguistic cues, understanding the distribution of actions can be challenging for learners, especially when the structures differ significantly between English and Arabic (Wu & Ionin, 2022).



Figure 7. A test item showing the inverse reading of a sentence containing numbers: *Two architects built three houses*

Numerical sentences (Group C) could be challenging to learners due to the complex relationships between quantities and objects. The difficulty with inverse readings in numerical sentences potentially demonstrates the impact of linguistic distance on the interpretation of scope ambiguity in L2. It is possible that the logical demands of these sentences interact with L1 transfer effects, an area worthy of future research (Demir, 2020). These findings might support Westerstahl's (2007) assertion that scope ambiguity arises from sentence structure rather than grammatical rearrangement. For example, in inverse readings (e.g., *two architects built three houses*), participants must reconcile the relationships between quantities and objects. Arabic-speaking EFL learners may struggle with English's stricter syntactic cues, which require inferring relationships from fixed word order. This difficulty may contribute to the lower mean scores for numerical sentences compared to other types.

In contrast, universal quantifier sentences (Group B) had the highest mean score of 7.26, which may indicate easier processing. Their clarity is in agreement with participants' intuitive understanding, reducing the need for syntactic restructuring. This suggests structural simplicity minimises ambiguity, as participants may rely on certain L1 patterns in L2 (Zibin et al., 2024).

Existential quantifier sentences (Group A) achieved an intermediate mean score of 6.16, reflecting moderate complexity. These sentences require greater syntactic flexibility, particularly in surface readings (e.g., *A bird is perched in every tree*), necessitating reanalysis of the quantifier's scope. Higher proficiency

participants performed better (as shown in Table 6), medium-proficiency participants faced challenges, highlighting the influence of linguistic distance on comprehension.

4.3. Discussion on the relationship between English proficiency and types of scope ambiguity

The study's findings indicate that English proficiency significantly influences comprehension of scope ambiguity, especially in sentences with mid-sentence embedded quantifiers like *every*. High-proficiency participants outperformed medium-proficiency ones. This supports the notion that greater syntactic familiarity aids in understanding complex structures. In simpler sentence types, such as universal quantifier sentences, no substantial differences emerged between proficiency groups. This suggests that advanced proficiency enhances comprehension of complex sentences, while gaps narrow in straightforward ones. The lack of variation in simpler sentences supports the idea that comprehension difficulty increases with structural complexity, demanding higher linguistic skills (Zibin et al., 2024).

No significant difference emerged between high and medium proficiency groups for universal quantifier sentences, likely due to the structural simplicity that reduces potential ambiguity. These observations align with Zhang's (2023) findings, which suggest that less complex structures are generally easier to process. Future research could investigate whether this ease of processing extends to sentences with clear scope structures. The meaning becomes clearer by positioning *every* first, so both medium and high proficiency participants found it easy. This sug-

gests straightforward syntactic patterns do not depend on advanced skills for comprehension, as the initial placement of *every* contributes to clarity. This supports Scontras et al. (2017), who noted that structural factors can lessen proficiency differences in scope ambiguity comprehension, particularly in predictable configurations.

In the case of numerical sentences, there was no difference in comprehension between medium and high proficiency groups. This supports language transfer theory, suggesting that when L1 and L2 lack relevant syntactic similarities, L2 proficiency has limited impact on comprehension. Numerical sentences often rely on logical reasoning rather than linguistic processing, which may be less influenced by language proficiency. According to Odlin (2022), complex syntactic structures can be difficult for L2 learners. Consequently, both groups exhibited similar performance outcomes in interpreting numerical relationships. This might suggest that the challenges posed by these structures are not easily overcome by increased proficiency alone, which highlights the influence of underlying L1 transfer effects, or other factors affecting the interpretation of complex sentences (Scontras et al., 2017).

Learners faced difficulties with sentences containing existential quantifiers (e.g., sentences using *a* at the beginning), possibly due to their intermediate level of syntactic complexity, as these structures involve relationships between different sentence elements. As Isurin (2021) notes, learners often struggle when L2 syntactic patterns differ from their L1. This interaction between syntactic transfer and linguistic distance can result in different difficulties in processing ambiguous structures, a phenomenon supported by second language acquisition theories. Furthermore, ambiguity itself can impede comprehension, as evidenced by Setiawan's (2014) finding that ambiguity in EFL writing led to misunderstanding. The finding that L1 affected comprehension of L2 scope ambiguity in sentences with *every* supports Kim's (2010) work, which noted that Korean EFL learners prefer broad-scope readings due to L1 influence, similar to Arabic-speaking EFL learners in this study.

4.4. Discussion related to L1 transfer

The challenges with inverse readings stem from syntactic transfer, where L1 structures impact L2 processing (Philipp & Zimmermann, 2020). For instance, in the case of *Every man is sitting against a barrel*, the surface reading – where each man has his own barrel – is more straightforward for Arabic speakers. These structures agree with Arabic constructs like *كل رجل يجلس بجانب برميل* or the Jordanian *كل زلة قاعد جنب برميل*, which depict a one-to-one relationship between the quantifier and individual subjects. This similarity makes the surface reading intuitive due to the structural similarity in Arabic, minimising the need for complex reinterpretation.

In contrast, for sentences involving existential quantifiers, Arabic speakers may find the inverse reading – where each tree has a unique bird perched on it – more natural, agreeing with common Arabic patterns. For instance, expressions like *هناك شجرة يقف عليها طائر*

or the Jordanian *هناك شجرة واقف على كل شجرة عصافير* are often interpreted as implying a different bird per tree. In these cases, the inverse reading appears to match their typical processing of distributive relationships. The inverse reading in English – such as *All men are sitting against one barrel* – can require a syntactic restructuring, but this interpretation may be more intuitive for Arabic speakers in some contexts, because it reflects familiar semantic and pragmatic patterns in their L1. However, the broader scope of the inverse reading, especially in the context of *every tree*, involves more complex syntax in English that conflicts with Arabic's flexible word order and quantifier usage, leading to difficulties in accurate interpretation. The surface reading – *Every man is sitting against a barrel* – is simpler and more consistent with canonical English syntax, thus easier for learners to process and less prone to L1 interference. This disparity between the two interpretations illustrates how the type of sentence influences processing strategies, with tendencies favouring either the surface or inverse reading depending on their L1 habits. The reliance on familiar L1 patterns can lead to errors, especially when the English input diverges from those norms (Isurin, 2021; Odlin, 2022).

Inverse readings require learners to reinterpret English syntax, conflicting with Arabic's default, more flexible word order and quantifier usage. As suggested by Adam (2024), the SVO structure of English contrasts with Arabic's flexible syntax, which can often cause learners to rely on their L1 strategies – particularly when the L2 structure deviates from familiar patterns. This reliance on L1 strategies can complicate the comprehension of inverse scope, especially in sentences involving complex scope ambiguities (Philipp & Zimmermann, 2020).

On the other hand, surface readings generally follow canonical, straightforward syntactic patterns, which are in line with principles of syntactic simplicity in psycholinguistics (Scontras et al., 2017). Such structures, like the explicit *every* at the beginning of a sentence, reduce ambiguity and likely minimise L1 interference, enabling participants to process these sentences more easily. This phenomenon is in line with the concept of positive transfer, where L1 structures consistent with L2 norms support better comprehension. Zibin et al.'s (2024) findings that higher proficiency learners can adapt their syntactic processing to better align with L2 norms further support this view.

Participant proficiency levels influence their ability to interpret both surface and inverse readings. Less proficient learners tend to rely more heavily on their L1, which increases transfer effects and ambiguity, while higher proficiency learners are better able to adapt to the syntactic norms of L2. Nonetheless, even advanced learners sometimes struggle with inverse readings, reflecting their inherent complexity and the divergence from common syntactic patterns (Philipp & Zimmermann, 2020).

In summary, these findings support the theory of language transfer, demonstrating that L1 influence is strongest when L2 structures differ from L1 norms. The comparative ease with surface readings illustrates how clarity in sentence structure can

facilitate comprehension across proficiency levels. Moreover, as Zibin et al. (2024) suggest, increased exposure to L2-specific patterns diminishes transfer effects, leading to improved understanding of complex sentences in L2.

5. CONCLUSION

This study examined how English proficiency influences the comprehension of doubly quantified sentences and the distinction between surface and inverted readings in three sentence types: numerical sentences, existential quantifier sentences and universal quantifier sentences. Results indicated that higher proficiency significantly improved understanding of existential quantifier sentences. This suggests that advanced learners' grammatical knowledge allows them to correctly parse the sentence structure and determine the scope relations between the quantifiers in these sentences. In contrast, proficiency did not significantly affect comprehension of numerical statements or universal quantifier sentences, indicating that the latter are simpler and require less proficiency.

The study found that all participants faced the greatest challenges with numerical statements due to the mental effort required to connect numbers and sentence objects, resulting in lower mean scores. Similarly, existential quantifier sentences were challenging due to complex syntactic links between the quantifiers. Conversely, universal quantifier sentences received higher mean scores, likely because their scope is more predictable.

Surface readings in existential quantifier sentences could have been more difficult to comprehend. In the context of existential quantifiers, the inverse reading appears to be more in line with Arabic expressions, which emphasise collective relationships. The more English based thinking of the one-to-one relationships with surface reading could have been a hindrance. Future research is needed to investigate this potential influence of L1 on the interpretation of existential quantifiers, while also considering the role of individual differences and task-related factors.

Inverse readings in universal and numerical quantifier sentences that involved reinterpretation of the relationship between numbers and objects were associated with a higher error rate in participant responses, suggesting potential difficulties with that type of sentence interpretation. The added complexity of changing the number's scope makes inverse readings more challenging to grasp compared to surface readings in certain cases, possibly due to the greater deviation from the sentence's surface structure that is required to arrive at that interpretation. The results support the theory of language transfer, showing that learners' L1 influences their processing of L2 structures. Arabic-speaking learners often relied on L1 patterns, leading to challenges in interpreting scope ambiguity in English. This may also explain their better performance with surface readings in universal and numerical quantifier sentences, which aligned more closely with their intuitive processing.

Further research should explore how different levels of linguistic exposure impact the understanding of scope ambiguity, including factors like multilingualism and the frequency of complex syntactic patterns in daily interactions. Although the study focused on English proficiency, participants' understanding of numerical sentences could be influenced by cognitive factors such as logical reasoning and working memory capacity. Future research should investigate the relationship between these cognitive traits and sentence comprehension, particularly for sentences with quantifiers like *every*. Future research should also focus on the cognitive processes involved in inverse reading comprehension, as these readings were consistently challenging in universal and numerical quantifier sentences. Neuroimaging or eye-tracking methods could help understand how participants mentally rearrange sentences in real time. Given that participants struggled with numerical sentences, further research is needed to explore whether specific instructional strategies can improve students' grasp of scope ambiguity in mathematical and logical contexts. Such studies may influence curriculum development and language instruction in areas requiring cognitive and linguistic reasoning.

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Original Research

A constructivist inquiry into English-Medium Instruction in Moroccan higher education

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As Morocco undergoes a shift in its linguistic landscape, English has gained prominence as a key medium for academic and professional mobility, particularly in science, technology, and business fields. This study investigates the recent implementation of English-Medium Instruction (EMI) at tertiary education in a context traditionally dominated by French and Arabic. In particular, it explores the perceptions, experiences, and strategies of Moroccan university students in a private institution in Casablanca regarding the adoption of EMI in Computer Science and Business Administration programmes. Drawing on a qualitative design grounded in constructivist grounded theory, data were collected through semi-structured interviews with 35 undergraduate students and analysed through open, axial, and selective coding. Over 300 initial codes were generated, leading to the emergence of key themes such as the global value of English, institutional and pedagogical barriers to EMI, lecturer preparedness, and the need for multilingual balance. Findings reveal strong student support for English as a global language of science, communication, and employment, while also highlighting significant challenges, including limited early exposure, underprepared instructors, and lack of disciplinary language support. Students advocated for the need for early EFL integration at the primary level, EMI-specific teacher training, and the normalisation of English for Academic Purposes (EAP) across all disciplines. Importantly, they also called for the preservation of local languages through a balanced multilingual policy.

KEYWORDS: English-Medium Instruction, EMI, language policy, higher education, Morocco, student perceptions, multilingualism

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1. INTRODUCTION

English-taught programmes are increasingly being adopted in higher education worldwide (Dearden, 2016) due to English's global rise as a lingua franca in education, science, and the labour market. English as a Medium of Instruction (EMI) is used to

promote internationalisation, enhance students' English proficiency, and boost graduate employability (Galloway & Rose, 2021). Governments and policymakers, particularly in the Global South, are supporting EMI as part of broader educational reforms to align with global standards and improve access to

'In recent years, English has emerged as a language of increasing importance in Morocco. This shift reflects broader global trends in which English functions as a lingua franca across domains such as education, international trade, research, and technology. Within Morocco, English is gaining ground in both policy discourse and public attitudes, particularly among youth and university students who view it as a vehicle for upward mobility, international engagement, and access to global knowledge'

international academic and professional opportunities (Dearden, 2016; R'boul, 2024). This global shift toward EMI is also increasingly reflected in Morocco, where language-in-education policy is deeply intertwined with the country's historical and sociolinguistic complexities. Morocco's linguistic landscape has long been shaped by its complex colonial history and post-independence language policies (Sayeh & Razkane, 2022, 2025). Following independence in 1956, the Moroccan state adopted a policy of Arabisation aimed at promoting Arabic as the official language of education and administration (Sayeh & Razkane, 2022). However, French, as the language of the former colonial power, maintained a dominant role in higher education, science, commerce, and governance (Belhiah, 2022; Sayeh & Razkane, 2022, 2025). To this day, French remains deeply embedded in institutional and academic life, particularly in scientific and technical disciplines, effectively functioning as Morocco's *de facto* language of instruction in many university programmes (R'boul, 2024; Sayeh & Razkane, 2022).

In recent years, English has emerged as a language of increasing importance in Morocco. This shift reflects broader global trends in which English functions as a lingua franca across domains such as education, international trade, research, and technology (Kurniawan, 2024; Sofyan, 2021). Within Morocco, English is gaining ground in both policy discourse and public attitudes, particularly among youth and university students who view it as a vehicle for upward mobility, international engagement, and access to global knowledge (Ben Hammou & Kesbi, 2023; Nadri & Hoaucha, 2020). Pilot EMI programmes in secondary schools (Anaam & Kerouad, 2024; Ben Hammou & Kesbi, 2023) and the increasing adoption of EMI in tertiary education reflect a growing recognition of English in Morocco as a strategic asset prerequisite for professional and academic development and global integration (Belhiah, 2022; Nadri & Hoaucha, 2020; R'boul, 2024). Also, the Moroccan Ministry of Higher Education supports the adoption of EMI in tertiary education to increase graduates' global employability and boost their English alongside French, and thus strengthen their multilingual proficiency (Daniel & Ball, 2010).

Despite this rising interest in English, Morocco's educational language policy remains largely anchored in French. This creates a misalignment between traditional institutional structures and contemporary global realities (Sayeh & Razkane, 2022).

While many Moroccan students and educators increasingly favour English due to its international relevance, French continues to be the dominant medium of instruction in higher education, leading to linguistic tension and educational inequity (Belhiah, 2022; R'boul, 2024). Moreover, the introduction of EMI in Moroccan universities in various scientific and technical fields such as maths, physics, biology, Computer Science, and Business Administration, poses a number of pedagogical and infrastructural hurdles. These include inadequate faculty preparation, limited access to EMI-qualified instructors, and gaps between students' linguistic skills and the demands of English-based instruction (R'boul, 2024; Nadri & Hoaucha, 2020). While students may perceive EMI as beneficial for academic and professional development, many report difficulties with comprehension, terminology, and the cognitive load of learning complex content in a non-native language (Ben Hammou et al., 2025).

Although plenty of research has explored EMI in Europe and Asia, few studies have examined the EMI implementation in North African contexts that are largely under-researched (Curle et al., 2024). Many scholars (Curle et al., 2024; Galloway & Rose, 2021; Macaro et al., 2020) call for the investigation of EMI in such multilingual and multicultural settings like Morocco to gain a better understanding of EMI's unique challenges and potential in such contexts. Moreover, while most previous EMI research has examined the transition from L1 instruction to EMI as an L2, this study focuses on the less-explored shift from an L2 French-medium instructional context to an L3 English-medium context in Morocco, a postcolonial, francophone setting where English is neither an L1 nor the traditional L2 of instruction. This study seeks to fill this gap by exploring how Moroccan university students majoring in Computer Science and Business Administration programmes at a private university in Casablanca perceive the implementation of EMI in higher education. The study also examines these students' attitudes towards EMI and the challenges and opportunities they associate with learning content in Computer Science and Business Administration in English. Additionally, the study investigates these students' language learning strategies and their policy-related suggestions for improving EMI implementation and language education more broadly. Based on these objectives, the following research questions guide the current study:

1. What are students' perceptions of English in Moroccan society and education?
2. How do students experience EMI, and what challenges and opportunities do they associate with it?
3. What strategies do students use to cope with EMI, and what are their policy-related suggestions?

This research contributes to ongoing discussions about EMI and language planning in non-Anglophone contexts, particularly in postcolonial societies navigating between local languages, former colonial languages, and English as a global lingua franca. The novelty of the current research lies in its unique focus on the transition from an L2 (French) to an L3 (English) medium of instruction given that the target students received scientific

courses in French in secondary education. Hence, the study seeks to highlight how these students in a private Moroccan university deal with this shift amid evolving national language policies. By focusing on student voices, the study provides empirically grounded insights into how EMI is perceived and practiced among students studying Computer Science and Business Administration at a private university. These insights are valuable for policymakers, educators, and curriculum developers aiming to implement equitable and effective language policies in Moroccan higher education.

2. THEORETICAL BACKGROUND

2.1. The global importance of English

English has firmly established itself as the global *lingua franca* that plays a pivotal role in cross-border communication, international business, academia, and technological advancement. It goes beyond its linguistic function and serves as a unifying medium that promotes collaboration, mutual understanding, and efficient information exchange across cultural and national boundaries (Kurniawan, 2024; Shenbagam, 2024). In international discourse, English facilitates communication among speakers of different native languages and emerges as the dominant language in diverse fields such as education, travel, diplomacy, and science (Kurniawan, 2024; Sofyan, 2021).

English is widely used in academia and education as a primary language that fosters intellectual collaboration and the global exchange of knowledge. In this regard, Sofyan (2021) emphasises English's dominant role in delivering content and enabling communication in different disciplines such as medicine, engineering, commerce, tourism, and the internet. This ubiquity not only enhances access to global information but also reinforces English's authority in knowledge production and distribution. Nearly 80% of Scopus-indexed journals are published in English, making linguistic proficiency a prerequisite for participation in global research communities (Márquez & Porras, 2020). Scholars such as Kawakibi and Indrawan (2024) argue that the dominance of English in academia improves the speed and impact of international research exchange, thanks to its grammatical simplicity and digital flexibility. However, this linguistic hegemony creates substantial barriers for non-native English-speaking scholars, who may find their work evaluated more on language proficiency than scientific merit (Baker, 2024). Consequently, diverse epistemologies risk being marginalised, reinforcing global academic inequalities (Baker, 2024; Márquez & Porras, 2020).

In addition to academia, English plays a central role in international business and employment. As the default language in many multinational corporations, English proficiency enables seamless collaboration among culturally diverse teams and supports the operational efficiency of global organisations (Tan, 2024). Proficiency in English is increasingly viewed as a key employability skill, particularly in international contexts, where it enhances access to global opportunities and career advancement (Tomar, 2024). In industries such as hospitality, trade, and

tourism, English proficiency is essential not only for job interviews but also for daily workplace communication (Rido, 2020). In response, universities are intensifying their focus on English language training to better prepare students for the global labour market (Hidayat, 2024; Rido, 2020). English not only fosters effective communication among diverse stakeholders but has also become a critical skill for international business success (Rattan, 2024). However, due to the gap between their English proficiency and employer expectations, many graduates call for curriculum reforms that better align language instruction with professional needs (Hidayat, 2024).

In addition, some scholars, such as Atasheva (2024), contend that learning English in addition to one's first languages can enhance cross-cultural communication, encourage multilingualism, and create a more diverse global workforce. Furthermore, Shenbagam (2024) contends that succeeding in technology-driven businesses entails a mastery of English as it is the primary language used in documentation and conversation. Overall, despite the fact that English promotes international academic participation, professional achievement, and technology integration, its dominance in many fields presents serious questions related to language fairness, access to knowledge, and cultural inclusivity (Márquez & Porras, 2020). Accordingly, some academics support more inclusive laws and teaching methods that honour the importance of English in international institutions while fostering linguistic variety (Atasheva, 2024; Baker, 2024).

However, the overreliance on English in professional settings has raised concerns. While English enhances employability, some argue that exclusive emphasis on this language may marginalise non-native speakers and overlook other valuable competencies (Tan, 2024). Similarly, Otilia (2013) highlights that although English proficiency is linked to access to vital information and economic mobility, its mastery can create a gap between its fluent and non-fluent speakers. Moreover, the global spread of English has often been interpreted through the lens of linguistic imperialism (Phillipson, 2010), which frames its dominance as both a product and a reinforcement of Western economic, political, and academic hegemony. In postcolonial, multilingual settings, however, English is also embraced for its instrumental value, a pathway to education, employment, and international mobility, rather than for its intrinsic cultural or literary significance (Gardner & Lambert, 1972). This utilitarian orientation aligns with neoliberal views of language as a form of human capital, where linguistic proficiency is commodified for its market value (Block et al., 2012). Yet, scholars caution that such apparent empowerment may coexist with, or even mask, structural inequalities and pressures to conform to global linguistic norms (Piller & Cho, 2013). While previous research has focused on various non-anglophone contexts and explored the tensions between the perceived empowerment associated with English as a form of human capital and the reinforcement of underlying power imbalances and linguistic inequality (Dearden, 2014; Ekoç, 2020; Yang et al., 2025; Zhou et al., 2020), less

attention has been given to how these dynamics unfold in Moroccan higher education, particularly within self-selected, English-medium programmes. This gap invites a closer examination of whether enthusiasm for English signals a shift in language ideologies in the Moroccan context or reflects the reproduction of existing global hierarchies.

2.2. The implementation of EMI

The implementation of EMI in higher education has introduced many promising benefits, especially in non-native English-speaking contexts. A primary advantage is the development of students' English proficiency that is critical for academic literacy and professional success in a globalised workforce (Alam et al., 2024; Anggraini, 2023; Botha, 2024). By delivering subject content in English, EMI not only fosters language acquisition alongside disciplinary knowledge but also helps students develop essential skills such as critical thinking, collaboration, and adaptability (Ekoç, 2020; Saldo et al., 2025). Furthermore, EMI aligns with global academic standards and facilitates access to international scholarly materials (Botha, 2024; Özçelik et al., 2024). Researchers also argue that exposure to diverse linguistic environments not only promotes students' intercultural competence but also broadens their global outlooks (Anggraini, 2023).

However, several obstacles face the implementation of EMI. The low proficiency in English among Teachers and students was reported to hinder academic performance and content comprehension (Botha, 2024; Özçelik et al., 2024). Students were also found to struggle with understanding specialised terminology and the lecturer's foreign accent, which often resulted in increased cognitive load and academic stress (Lai & Idris, 2025; Özçelik et al., 2024). Additionally, other studies reported that both students and instructors who preferred instruction in their first languages because of concerns about inclusivity and identity or cultural resistance also undermined the successful transition to EMI (Saldo et al., 2025). These obstacles are not only limited to personal barriers but extend to institutional ones, such as a lack of EMI pedagogy training and insufficient professional development or linguistic support from institutions (Alam et al., 2024; Anggraini, 2023). Institutional issues like insufficient policy frameworks, lack of specialised support services, and lack of cooperation between language and content specialists make it more difficult to maintain successful EMI programmes. In summary, despite its benefits, EMI's success depends on institutional dedication to linguistic and cultural diversity, educator capacity building, and context-sensitive planning.

2.3. EMI in the Moroccan higher education context

In Morocco, the gradual adoption of EMI in higher education reflects a broader effort to align with global academic and economic trends. One of the major factors of EMI integration is its perceived ability to improve students' employability, access to international research, and preparedness for global collaboration. Although the environment of EMI is still developing in Morocco, preliminary findings show that educators and policy-

makers are both hopeful and concerned. Pilot programmes in secondary school have shown promising results, with an increase in student engagement and English proficiency, especially in science and math (Anaam & Kerouad, 2024; Ben Hammou & Kesbi, 2023). Recent studies indicate that students in STEM and business-related programmes at the tertiary level see EMI as a way to enhance their academic performance, language proficiency, and prospects for employment in international markets (Belhiah, 2022; Nadri & Hoaucha, 2020). This is particularly important for students majoring in business administration and computer science, who frequently want to work for multinational corporations or take part in cross-border innovation ecosystems.

Notwithstanding these advantages, there are a number of pedagogical and structural obstacles to EMI adoption in Moroccan universities today. According to recent studies, a large number of teachers are undertrained to teach scientific material in English (R'boul, 2024). The sociolinguistic effects of EMI on Morocco's heterogeneous linguistic landscape are also called into question by worries about the marginalisation of Arabic and Berber (R'boul, 2024). These difficulties are similar to those seen in North Africa, where nations like Algeria and Tunisia are moving toward EMI in order to satisfy international demands. However, they are also facing challenges like curriculum adaptation, faculty readiness, and multilingual classroom dynamics (Melliti, 2024). More research that examines how students view and experience EMI in these fields is necessary to ensure its successful implementation in Morocco, especially in fields like computer science and business administration. Therefore, the purpose of this study is to meet that need.

3. MATERIAL AND METHODS

3.1. Research design

This study employed Constructivist Grounded Theory (CGT) (Charmaz, 2017; Glaser & Strauss, 2017) to generate hypotheses inductively, based on participants' real-life experiences and perceptions. In CGT research, data and analysis are co-constructed by participants and researchers. Unlike classical Grounded Theory methodology, in CGT, researchers use their prior knowledge, experiences, theoretical sensitivity, and interaction with the participants to interpret the data, allowing analytic categories to emerge.

CGT is suitable for this kind of study, which explores a new EMI environment where English is introduced into a space which is L2-French dominated. This kind of setting is under-researched in EMI literature. Hence, our aim was not to test predetermined hypotheses, but rather to generate preliminary, data-driven hypotheses that could inform future research in similar EMI contexts.

3.2. Participants

The study recruited 35 undergraduate students from a private university in Casablanca. Participants, majoring in *Computer Science* (CS) or *Business Administration* (BA), were

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selected using a theoretical sampling technique to ensure that emerging concepts and categories from the data were thoroughly explored and developed, as required by grounded theory methodology. The participants' mean age was 19.83 years ($SD = 1.54$), which indicates a relatively homogeneous age distribution. The sample consisted of 21 females (60%) and 14 males (40%). Regarding academic discipline, 24 participants (68.57%) were enrolled in CS and 11 (31.43%) in BA. Their English proficiency ranged from B1 to B2. All participants were informed about the purpose of the study and provided written consent. Participation was voluntary, and confidentiality and anonymity were maintained throughout the research process.

3.3. Data collection

Following CGT (Charmaz, 2014), data collection and analysis proceeded concurrently and iteratively. Semi-structured interviews were used to gather data regarding students' attitudes, experiences, and beliefs regarding the implementation of EMI at their institution. The questions addressed issues like the importance of French, the need for English, EMI preparedness, preferred languages, and language learning techniques. The semi-structured interviews were conducted in English and audio recorded.

Data analysis began immediately after the first interview, following open, axial, and selective coding techniques. Emerging codes and categories were compared constantly across cases to capture potential connections between categories. Accordingly, interview prompts were refined, and new participants were recruited. The same process was followed in each interview until no new codes emerged, signalling theoretical saturation. A total of over 300 initial codes were generated using participants' own words wherever possible.

3.4. Data analysis

To analyse the data, grounded theory procedures were followed (Charmaz, 2006; Glaser & Strauss, 2017). First, the researchers started with open coding, where each line of the data was examined and labelled for significant concepts. Transcripts were read line-by-line and coded inductively. A total of over

300 initial codes were generated using participants' own words wherever possible. Examples include *'language of the world'*, *'scientific research is in English'*, and *'English helps my learning'*. Then, axial coding was used to group similar codes and identify relationships between categories, such as *Global Importance of English*, *Academic Access*, and *French as Historical Dominance*. Finally, selective coding was conducted to identify the core category that integrates all the major themes. Individual participant responses were coded and grouped into subthemes and larger thematic categories. Constant comparison was used throughout the analysis to refine codes and categories and ensure theoretical saturation, which was achieved at the 35th interview as no new concepts emerged.

3.5. Inter-coder reliability and validity

Three researchers coded the data independently and compared their findings to guarantee analytical rigor. An adaptation of Allen's (2017) reliability formula for multiple coders was used to calculate inter-coder agreement: $3M/(N1 + N2 + N3)$, where M is the number of shared codes among the three coders and $N1$, $N2$, and $N3$ are the total number of codes assigned by each researcher, respectively. The inter-coder reliability value of .850 indicated a high level of consistency and agreement in coding among the three researchers.

4. RESULTS

4.1. The ascending role of English in Moroccan society and higher education

Findings revealed that all participants perceived English as a strong instrument that is necessary for international communication, academic access, and economic mobility. Despite their awareness of the historical supremacy of French in Morocco, they exhibited a discernible trend in favour of English due to its greater applicability and importance at the international level. Many viewed French as the traditional foreign language of education and administration, inherited from Morocco's colonial past. As evidenced by some respondents, *'French is more common in Morocco than English since it is the primary foreign language of Morocco'* (R19), and *'It reflects the country's historical, cultural, and global positioning'* (R12). However, despite this legacy, a noticeable shift towards English preference was evident. Some participants noticed that *'French has been the dominant foreign language in Morocco due to historical ties, but English is gaining importance as it is an international language'* (R34) and *'is more globally relevant and should be prioritised for modern needs'* (R25).

As revealed from the responses, the growing tendency towards English is linked to its use in *'global scientific communication, [...], access to advancements and collaboration'* (R26). It is identified as a global language that facilitates communication across borders. Several cohorts perceived it as a necessary skill to interact with people from different countries, especially in multicultural or international contexts. This international status of English was often cited as a primary motive for learning the language, particularly its role in international business and technology. For instance, R6 remarked, *'Yes, because English is the most known language in the world, and some workers or bosses don't speak Arabic or French, so you have to*

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speaking English'. Similarly, R12 noted, '[English] is increasingly necessary due to several reasons like globalisation and international opportunities'. These informants recognised English as a vital global tool to navigate academic, professional, and international spheres.

Additionally, many participants underscored English's role as the language of academic discourse and scientific research, due to its perceived simplicity and usefulness in academic research and learning. They explained that this shift towards English is mainly due to its dominance and practicality in international research, as one respondent claimed, 'All scientific research is done in English' (R22). Another added, 'English is the language of technology and science' (R11). The vast majority of the participants believed that proficiency in English grants access to global knowledge, especially in science, technology, and innovation. Although they acknowledged that while French still dominates in Moroccan higher education, many recognised that English is rapidly gaining ground, in alignment with global trends and the increasing internationalisation of academic discourse. For example, R28 noted that 'In Morocco French remains dominant in higher education while English is rapidly growing in importance reflecting a global trend and shifting educational priorities'. Participants emphasised that fields such as science and technology are progressively adopting English, with one respondent stating, 'The professional science in Morocco is shifting towards English' (R18). Others expressed concern about the limitations imposed by the continued reliance on French, which, as noted, is used in fewer countries and thereby restricts access to wider academic and scientific communities: 'Most of the world uses English which limits our research' (R23). These perspectives reflect a growing awareness among Moroccan university students of the strategic value of English in research and academic advancement.

Moreover, all participants recognised the economic and professional value of English. They strongly associated English with increased career prospects, economic growth, and international employment. They perceived it as a vital tool to access opportunities in tourism, business, and global markets. For example, R2 explained, 'Learning English can be very beneficial; it can help in economic and job opportunities, education, tourism, business'. This was supported by R25, who stated, 'For Morocco, a country that aims to strengthen its global ties and improve its

economic competitiveness, English is essential'. However, while some cohorts underlined the usefulness of French for economic growth, others emphasised that this language, unlike English, is globally limited, and that 'English will facilitate economic and educational progress in a fast-digitalised world' (R25; R32) and 'will allow the country to get ahead of its competitors' (R4). The use of English in Morocco was perceived as a gateway to keeping track of international developments and engagement in global academic collaboration. Overall, English was seen not only as an academic asset but also as a professional necessity.

4.2. EMI: opportunities and challenges

Findings revealed that although the participants showed strong support for EMI as a modernising force, they also highlighted key challenges related to readiness, comprehension, and infrastructure.

4.2.1. Opportunities presented by EMI

The majority of participants believed that EMI programmes in Moroccan universities were necessary to meet international standards for education. Viewing English was the most widely used language in academia, business, and science, they perceived studying in EMI programmes prerequisite for international employment prospects. R1 thought that 'having more courses taught in English will better prepare students for the international job market and opportunities', while R3 stated that 'it's a good idea because English is the language of science and business'. Additionally, EMI was linked to global competitiveness and mobility. According to R8, EMI is advantageous for students who want to pursue higher education overseas. In this regard, EMI programmes were seen as a means of conforming to more general international norms and patterns. Such programmes, for example, 'enhance students' global competitiveness, provide access to international research, and align with the growing importance of English in academia and the job market', according to R12. Similarly, R30 asserted that the 'introduction of English-taught programmes enhances Morocco's education systems and aligns with international standards'. According to these replies, EMI is widely seen as a proactive and strategic reform in Moroccan higher education.

Findings also highlighted that the vast majority of participants favoured EMI in science and technical subjects due to its global dominance in research and academic resources. They emphasised that English facilitates direct access to up-to-date scientific literature and online databases. For instance, R35 explained, 'English [is preferred] because most scientific terms are in it'. R8 added that English is 'more common in research papers and science subjects'. R28 explained that 'teaching science in English helps students access research and prepare them for international course[s]', while R3 stated that he would prefer 'English obviously, because most scientific research and books are in English; it will make studying easier'. Others saw English as the default global language of knowledge exchange. This preference was not merely about academic trends but also about practical access

to knowledge. Some respondents stated that *'you can find a lot of information on the Internet using this language [English]'* (R17) and *'resources [are] available online'* in English (R18). Others expressed a more global perspective, such as R32, who observed that *'in all the countries in the world, you can find scientific people speak and do research in English'*. The overwhelming tendency was to favour English in scientific disciplines, driven by its perceived role as a gateway to current research, academic engagement, and global communication due to its role as the global language of research and knowledge production.

Moreover, participants viewed EMI as beneficial, particularly in enhancing language proficiency and academic development. Several respondents noted that being exposed to English in content subjects helped them expand their vocabulary and practice reading, writing, and communication skills (R1). Others highlighted practical gains, such as being able to locate relevant scientific content more easily: *'English facilitates the learning programmes and you find what you need'* (R32), and *'Yes, I can find the related content in English'* (R15). For some, EMI also improved comprehension and classroom engagement, with R10 stating, *'I understand better that content that is being explained'*, and R8 emphasising that it *'made research in scientific content easier and [improved] understanding'*. Additionally, EMI was perceived as a means of expanding one's linguistic repertoire, as noted by R31: *'You add another language to your knowledge'*.

4.2.2. Challenges in Implementing EMI

Despite overall support for EMI, participants expressed divergent views regarding Morocco's readiness to implement EMI across higher education institutions. Some respondents believed that the current environment in Morocco is gradually becoming more conducive to EMI, citing the growing availability of English-language resources and early exposure to the language through media and schooling. Regarding the country's preparedness, they emphasised the increased availability of English-language resources, the proliferation of English-taught programmes, and the growing influence of English in Moroccan society. As R6 noted, *'There are a lot of English books and universities to learn around Morocco'*, and R29 pointed out that exposure to English through social media and entertainment content has increased students' familiarity with English. R14 stressed that early language exposure to English could accelerate readiness (R14), while others noted that EMI could support students planning to study or work abroad.

However, a significant number of participants raised concerns about insufficient preparation to implement EMI in Moroccan tertiary education. Many were cautious or critical of a full-scale shift to EMI, pointing to multiple systemic limitations, including insufficient teacher proficiency, weak student readiness, and the continued dominance of French in earlier levels of schooling. R15 explained, *'We're not ready yet; teachers need more training'*, a sentiment echoed by R5 and R26. R20 pointed out that *'lower education still uses French more'*, making the transition to EMI difficult. Likewise, R23 expressed concern over the

difficulty students might face transitioning to English at university after years of studying in French. Some felt that implementation was premature, with R16 arguing, *'It is not about being ready; I think they need to start first with public school so that everyone gets used to English'*. Others, such as R25 and R26, emphasised that progress is only partial and that *'more infrastructure, teacher training, and support'* are urgently needed to ensure a smooth transition.

Other challenges underscored by respondents are related to comprehension and cognitive load. Many participants reported that EMI could hinder comprehension, particularly in the early stages of learning when students lack sufficient language proficiency. R12 explained that low English proficiency *'may create difficulties in understanding complex concepts, lead to slower learning, and cause frustration'*, a concern echoed by R19, who found it initially *'challenging to grasp complex topics in a non-native language'*. Others agreed that EMI can slow down the learning process at first, especially in technical or abstract subjects, as noted by R28: *'It can make learning harder if skills aren't strong, especially in complex subjects'*. Similarly, R34 observed that EMI presents difficulties *'especially for students with weak English skills'*. However, several respondents acknowledged that these challenges tend to diminish over time. R1 noted that *'at first it can be challenging but then it becomes easier'*, and both R25 and R26 recognised that, despite early struggles, EMI eventually supports deeper understanding and access to global academic knowledge. As R35 succinctly put it, familiarity with English in advance *'makes learning [scientific terms] easier'*. Overall, while initial comprehension difficulties were a common experience, many participants described EMI as ultimately beneficial with time and exposure.

4.3. Learner preparedness and language planning

Participants revealed a strong awareness of the linguistic demands associated with EMI and shared a wide range of strategies they employ to improve their English skills. Their reflections also included calls for systemic changes to Morocco's language education policies and the need for early English exposure, teacher training, and a rethinking of the French-dominant legacy in the education system.

A key subtheme that emerged was the importance of early preparation to ensure EMI success. Many participants emphasised that English should be introduced in the early stages of education to build a solid linguistic foundation before entering university. Many participants offered policy-oriented recommendations, with a strong emphasis on the early integration of English into Morocco's education system. Several participants advocated introducing English instruction at the preschool or primary levels to ensure long-term proficiency and academic readiness. As R7 suggested, *'English should be taught starting from preschool'*, and R25 explained that early exposure *'improves fluency, enhances global competitiveness, and supports access to knowledge and opportunities'*. They believed that such early exposure would help normalise the use of English across subjects

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and prepare future generations for a globalised world. However, several respondents stressed that early English instruction would only be effective if teachers themselves were adequately trained. R2 noted, *'Train teachers in English'*, while R12 added that without teacher readiness, *'students cannot benefit from early English education'*.

Many participants described proactive and independent approaches to improving their English. A popular method involved consuming English-language media, including movies, music, and YouTube videos. As R1 explained, *'I watch educational videos in English and movies [and] practice speaking with classmates'*, while R3 added, *'Watching movies with subtitles, reading books... even talking to yourself'*. Other participants focused on reading, writing, and vocabulary-building techniques. R2 noted, *'If I come across something difficult, I write it down and look it up later'*, and R7 shared that she reads books and writes essays to reinforce language use. Other respondents stated that they used digital tools, such as language apps, online dictionaries, translation tools, and AI platforms, to help them improve their English proficiency (R5; R23; R34). Another strategy the participants used is interacting with classmates and discussing topics in English to develop fluency and confidence in this language (R14; R28).

Despite their personal effort, the participants identified several key language areas they need to improve to succeed in learning scientific content in EMI. Insufficient vocabulary repertoire, especially in relation to academic and technical terms, was among the most commonly cited language issues they had. In this regard, R1 underscored the importance of expanding vocabulary *'related to [her] study field'*, while others emphasised learning more *'technical words'* (R8), *'advanced English terms'* (R35), and *'academic vocabulary'* (R28). Another language problem the respondents mentioned is a deficiency in English grammar. A few participants said they had trouble writing. They emphasised the necessity of *'focus courses on academic writing and speaking'* (R26) and *'academic skills and technical language practice'* (R25). One of the language problems mentioned by the participants was a lack of effective oral communication abilities. Many students stated that they wanted to get better at public

speaking, pronunciation, and fluency in oral communication. R6 mentioned the need to increase confidence in *'public speaking, eye contact, and communication'*, while R9 wants to improve his English pronunciation. These reflections show a deep understanding of the linguistic requirements of EMI and a proactive approach to meeting them. This implies that confidence-building and presentation skills should be included in EMI preparation in addition to language mechanics.

Many respondents called for systemic changes that prioritise English over French as the primary language of instruction to better align Morocco's language education with international standards. They all agreed that English should replace French and become the main foreign language taught in Moroccan schools. For example, R30 suggested *'replacing French with English'*, arguing that it was essential to modernise Moroccan education. In a similar vein, R32 contended that *'if we want to change our reality, we should change our language from French to English'*. R16 agreed, hoping that this research would *'convince [policymakers] to hear our voice and replaced French with English'*. Many respondents supported starting EMI in elementary school, with R7 saying, *'Start EMI from primary school'*, and R14 stressing the significance of early normalisation of English across subject areas. While promoting English, some participants also voiced concerns about the potential marginalisation of Arabic. They emphasised the importance of maintaining linguistic balance by ensuring continued support for standard Arabic. As R23 cautioned, *'This generation is losing it [Arabic] even though it is supposed to be our language'*. Additional suggestions included expanding language workshops (R5), emphasising lifelong language learning (R6), and fostering bilingual competence in both English and the mother tongue (R29). Overall, students' policy perspectives reflected a desire for a forward-looking, multilingual education system that prepares students for global engagement while preserving their national identity.

5. DISCUSSION

5.1. The ascending role of English in Moroccan society and higher education

Findings confirm the increasing importance of English as a foreign language in Morocco despite the historical dominance of other languages, primarily French, the colonial language, and Standard Arabic, the official language. Participants consistently believed that English would continue to grow and possibly become Morocco's primary foreign language, replacing French due to its instrumental use in major domains of life, which resonates with the British Council's report (BC, 2021) about language attitudes and use in Morocco. Students described English as the global lingua franca and an essential tool for accessing scientific knowledge and achieving academic and professional success. These positive perceptions reflect a growing shift in language preferences and ideologies among Moroccan youth, confirming previous findings that reported changes in Morocco's language landscape, influenced by the global hegemony of English and the decline of French in former French colonies (Ben Hammou &

Kesbi, 2025; R'boul, 2024). However, these results must be interpreted with caution, given the study's narrow scope. The sample is drawn from a self-selected programme in a private institution in Casablanca, where students are recruited based on their English proficiency. Hence, the majority of participants possess good to excellent English skills, which may explain their enthusiasm for English and EMI. This suggests that students with inadequate English competence in a different context (e.g., a public university) might hold different attitudes.

Additionally, there are legitimate concerns that the spread of English in Morocco may exacerbate the existing linguistic hierarchies by disadvantaging local languages. R'Boul (2024) warns that calls for replacing a colonial language (French) with another imperial language (English) will perpetuate linguistic and epistemic dependence on the West, leading to neo-colonialism. This is consistent with Phillipson's (2010) theory of linguistic imperialism, which posits that the global dominance of English is driven by and reinforces power structures and hierarchies tied to Western economic and academic hegemony. However, participants in this study did not appear to be concerned about this dominance. Instead, they embraced English as a vehicle for self-advancement and empowerment, echoing the notion of instrumental motivation (Gardner & Lambert, 1972), suggesting that learners value a language not for intrinsic or cultural reasons but rather for concrete benefits, be it academic access, employment, or international mobility, to name a few. Theoretically, the participants' enthusiasm for English represents neoliberal views of language as a form of human capital (Block et al., 2012), where language mastery is valued for its economic utility. In students' view, English proficiency is an asset to enhance one's economic and social status, demonstrating an instrumental attitude towards language. Similar views were reported in other non-Anglophone settings (Dearden, 2014; Ekoç, 2020; Yang et al., 2025; Zhou et al., 2020).

In short, most participants in this private self-selected English-taught programme did not see English as a threat to their cultural identity but rather as an empowering tool that could help them achieve their academic and professional success. This perspective contradicts earlier postcolonial resistance to the spread of English (Phillipson, 2012) and with the widespread views of French as a colonial language (Ben Hammou et al., 2025; R'boul, 2024). However, it is not safe to assume that these views suggest a wider change in language ideologies among Moroccan youth, as such an assumption would require large-scale research across public universities throughout the country to assess its extent and variability.

5.2. EMI opportunities and challenges

The data reveal a paradox between students' aspirations and implementation challenges, which reflects the global discourse around EMI in multilingual post-colonial settings. On one hand, students in this specific study supported transitioning to EMI in Moroccan higher education, particularly in fields of science, technology, and business, corroborating the assumption

that English has become a *de facto* language of contemporary science and commerce (Kurniawan, 2024; Sofyan, 2021). They believed EMI would enhance their global competitiveness, help them integrate successfully in transnational markets, and facilitate access to cutting-edge scientific research. While these benefits have been widely documented in EMI research (Anggraini, 2023; Botha, 2024; Ekoç, 2020), the present study adds to the conversation by showing how these aspirations are articulated by students who have come from an L2-French-medium instruction environment. Students did not compare EMI to a national-language medium, but to another foreign language, which is still predominant in Moroccan higher education.

On the other hand, despite widespread enthusiasm for EMI in the Moroccan context (Belhiah, 2022; Ben Hammou & Kesbi, 2023), most participants in this study admitted that a large-scale shift to EMI in Moroccan higher education remains unfeasible under current conditions. Their concerns reflect deeper institutional and pedagogical limitations in addition to language barriers. This finding supports previous research by Ben Hammou and Kesbi (2023), who argue that a successful EMI expansion in Moroccan education is not supported by the country's current educational infrastructure.

In this study, students identified three major barriers that hinder successful transition to EMI in Moroccan HEIs. These obstacles include a lack of trained lecturers to teach scientific and technical content in English, the persistent dominance of French as the traditional medium of instruction in secondary and higher education, and students' and lecturers' poor English language proficiency. Our findings are in line with those of Özçelik et al. (2024), who reported those similar issues that hindered the EMI implementation in Turkey, including insufficient teacher preparation and a lack of institutional support. Our findings also agree with Alam et al. (2024), who emphasised the absence of sustainable professional development frameworks and a coherent EMI framework were among the key hurdles to EMI implementation in Indonesia.

Findings also reveal a crucial yet often overlooked aspect of language policy debates: the language policy continuity from the past to the present. Students repeatedly stated that the dominance of French in Morocco limits the successful adoption of EMI in Moroccan HEIs. This reflects the continuity of previous language policies, colonial legacy, and cultural identification, which all frame current orientations in language reforms. In this sense, the Moroccan multilingual context illustrates how English is adopted as a vehicle for modern aspirations, while it also collides with complex local education ecologies and language hierarchies (Ben Hammou & Kesbi, 2023; R'boul, 2024).

5.3. Learner preparedness and language planning

The study's findings revealed that participants were not only aware of the constraints associated with EMI implementation in the Moroccan context but also proposed proactive strategies to address them. First, they argued that an early, extensive exposure to EFL at primary education is essential to

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prepare for English-taught programmes in both secondary and higher education. This confirms earlier research, which shows that earlier exposure to English can enhance students' fluency, confidence, and ability to cope with academic content in English at higher levels (Galloway & Rose, 2021; Macaro et al., 2020). Yet, for early integration of EFL to be successful, students emphasised the need to prepare trained EFL teachers, corroborating Dearden's (2014) findings that language policy reforms tend to fail the objectives in the absence of adequate preparation and infrastructure.

In addition to early exposure to EFL, students were also aware of the importance of self-directed learning strategies in promoting their English skills and coping with the emerging challenges in EMI settings. Their enthusiasm for improving their English proficiency encourages them to work independently through different media, such as using subtitles, watching educational videos, and keeping vocabulary notes. These autonomous behaviours have been reported elsewhere (Rivero-Menéndez et al., 2018), yet in the context of this study, such agency operates in a context where institutional EMI support is minimal and where most students have transitioned from L2-French-medium instruction. However, the focus on autonomous learning as a strategy to cope with EMI challenges may not be available for all students, which raises equity concerns. As put by Ben Hammou et al. (2025), not all students have the socio-economic conditions to access digital tools that facilitate L2 learning, which risks widening the gap between privileged and disadvantaged students.

Despite their self-directed efforts to successfully integrate into the EMI environment, students admitted encountering language-related difficulties, which can be attributed to the specificity of the disciplinary English used in administration, business, and computer studies. Students reported difficulty mastering technical vocabulary and disciplinary literacy skills. These findings echo previous research on EMI, which calls for accompanying EMI implementation with EAP (English for Academic Purposes) and disciplinary English skills to help struggling students enhance their academic English proficiency and overcome content knowledge development barriers (Galloway & Rose, 2021; Özçelik et al., 2024). The challenges mentioned also reflect the cognitive load that students have to endure in EMI settings. They not only need to develop their content knowledge,

but they are also required to process a foreign language (L2/L3 – English). Sweller (1988) suggests that this dual burden can hinder students' learning unless it is mediated through pedagogical scaffolding and targeted language support.

Beyond their personal gaps and strategies, students called for policy-level reforms that prioritise English as Morocco's primary foreign language instead of French to align with global educational standards. These calls agree with previous findings that highlighted a growing preference for English among youths, a shift that signals a bottom-up shift in language ideologies in Morocco (R'boul, 2024). This bottom-up dimension is significant because it contrasts with Morocco's historically top-down language policy, where decisions about the medium of instruction have traditionally been driven by state-led reforms aligned with political and economic agendas. Participants emphasised the importance of preserving local languages, and, at the same time, advocated for a multilingual approach that both sustains national identity and promotes global openness. These perspectives also align with García and Wei's (2014) translanguaging theory, which frames multilingualism as an integrated communication model, rather than a set of hierarchical languages (Razkane et al., 2025).

6. CONCLUSION

This study revealed that Moroccan students enrolled in a private university perceive English as a powerful vehicle for academic success, professional mobility, and global integration. Despite the entrenched dominance of French in Morocco's education system, participants expressed a strong preference for English because of its utility in science, technology, and access to the international job market. Students also identified notable challenges that hurdle the effective EMI implementation, including limited English proficiency, insufficient EMI training for both students and faculty, inadequate early exposure to English, and difficulties with technical vocabulary and disciplinary content comprehension.

The study's findings offer valuable insights into the ongoing debate around language policy and education reform in Morocco. First, the study underscores the need for policymakers to reconsider the current language-in-education framework, which still heavily favours French. The strong preference for English among students in the current research reflects a growing disconnect between the current language-in-education policy, which continues to prioritise French, and the linguistic realities and aspirations of such students. This tension highlights the need for a policy shift that responds to students' evolving needs and global trends. Students' support for EMI also aligns with the increasing dominance of English in global research and professional fields. This suggests that continued reliance on French may limit Morocco's academic and economic competitiveness. Hence, policymakers and educational leaders should consider adopting a more gradual and context-sensitive approach to EMI implementation, ensuring alignment between language policy, curriculum design, and institutional capacity.

'Moreover, this study highlights the urgent need to introduce English instruction at earlier stages of schooling as many participants called for the introduction of English from the primary level to ensure long-term linguistic readiness. This suggests that language policy reform must not only address the language of instruction at the tertiary level but also re-evaluate the sequencing and intensity of English education throughout the system'

Moreover, this study highlights the urgent need to introduce English instruction at earlier stages of schooling as many participants called for the introduction of English from the primary level to ensure long-term linguistic readiness. This suggests that language policy reform must not only address the language of instruction at the tertiary level but also re-evaluate the sequencing and intensity of English education throughout the system. That is, EFL should be expanded to lower levels of schooling, preferably primary education, to prepare a generation of students who can cope with EMI successfully. At the same time, concerns about institutional unpreparedness, teacher training, and unequal access point to the risks of hasty or top-down implementation of EMI policies without adequate support structures. A gradual and planned transition toward English, particularly in science and technical fields, could better align Morocco's education system with global standards and opportunities.

In addition, effective EMI programmes require lecturers who are not only English proficient but also trained and qualified to teach complex content concepts in English. Thus, investment in EMI-specific training is necessary to enhance lecturers' EMI teaching skills. Also, English for Academic Purposes (EAP) should be integrated in all disciplines in HEIs to help students

cope with the language-related difficulties in EMI settings. Finally, while advocating for broader adoption of English, participants also called for the preservation of Morocco's linguistic diversity, supporting a multilingual education model that values both global and local languages.

Finally, the study also reveals student awareness of the importance of balancing multilingualism, especially the need to preserve Arabic while adopting English. This positions students as informed stakeholders in language policy debates, advocating for a forward-looking, inclusive policy that recognises both global engagement and national identity. Overall, our study calls for a comprehensive, inclusive, and phased language education reform that meets all Moroccan students' needs and aligns with both Morocco's sociolinguistic fabric as well as global academic trends.

Despite its contributions, this study has several limitations. It draws exclusively on students' perspectives and does not consider the views of teachers, administrators, and policymakers who are key players in EMI implementation. In addition, the focus on a single private university in an urban setting limits the generalisability of the findings to other contexts, particularly public universities and rural institutions. Finally, the reliance on self-reported data means that perceptions may reflect aspirations more than actual classroom practices.

To address these limitations, future research should expand the scope to include multiple stakeholders and diverse institutional contexts to capture a more comprehensive picture of EMI readiness in Morocco. Also, longitudinal studies could track the effects of EMI over time in classroom-based research to shed light on how multilingual students navigate academic content in English. Such research would deepen understanding of how global language trends intersect with local realities and inform evidence-based, equitable language policy reforms.

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Original Research

Economic and educational benefits of mother tongue and second language use: Evidence from Uzbekistan

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Despite growing recognition of the role of language skills in shaping human capital, the understanding of their influence on individual success in multilingual transition countries such as Uzbekistan remains limited. This study addresses this gap by empirically examining the interdependence of mother tongue and second-language use with individual income and academic attainment. The estimation draws on nationally representative microdata from the 2021 Household Budget Survey (HBS), based on a randomly distributed sample across all regions of Uzbekistan. The study estimates the return on language capital, contributing to a better understanding of its economic and academic outcomes in Uzbekistan. The empirical strategy applies well-established models (Marschak, Rubinstein, Grin, etc.) and the Mincer earnings function to new data using Ordinary Least Squares (OLS) with regional fixed effects, where income premiums are associated with each linguistic group and respondents' educational level. The findings reveal that the return on income for respondents with native Uzbek is not higher than for respondents who speak other languages. Moreover, native language education has no statistically significant effect on improving educational attainment levels. In contrast, the use of a second language (primarily English) increases earnings by 10–20% on average, with higher income premiums observed in economically active regions. The implications of the study include the interpretation of weaknesses in existing language practices and policies.

KEYWORDS: mother tongue, second language, income premium, language capital, educational attainment, Uzbekistan

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1. INTRODUCTION

Amid globalisation and digital transformation, language skills are becoming a key factor in accessing advanced levels of education, enabling upward socio-economic mobility and achieving higher individual earnings. Despite a wide range of empirical studies, the research problem is that the mechanisms by which both foreign and native languages influence income level and academic achievement remain poorly studied in the socio-economic context of transition countries like Uzbekistan. The purpose of the study is to identify and analyse the effect of the mother tongue and second language use on individuals'

income and academic attainment and to offer recommendations in the field of language policy and education. The subject matter of the study is individuals' socio-economic outcomes resulting from the use of the native or second/foreign language in Uzbekistan.

The following objectives were set within the study: (1) to systematise theoretical approaches to the economics of language as an instrument of human capital; (2) to assess the impact of native language status on academic integration and labour income in Uzbekistan; (3) to analyse empirical data on income premiums associated with knowledge of foreign languages in

Uzbekistan; (4) to formulate recommendations for improving language policy and educational strategy for the development of language competences in the country.

The main hypothesis put forward is that proficiency in one's native or foreign language is positively correlated with income level, implying that insufficient support for the native language in educational and institutional systems has a negative impact on the academic achievements of linguistic groups.

The methodological basis of the study is a quantitative analysis primarily based on well-established models (Marschak, 1965; Rubinstein, 2000; Grin, 2003) and the standard Mincer earnings theoretical function analysing income premiums depending on the educational level and language acquisition, alongside a set of control variables. To test the research hypotheses, Ordinary Least Squares (OLS) with fixed effects regression analysis methods were used (to assess the impact of native and second language and education on income and academic attainment) and logistic regression (to assess the probability of second language proficiency), taking into account differences between groups by level of education, native language and place of residence. For the quantitative analysis, log-linear income regressions were estimated for all regions of Uzbekistan using OLS with regional fixed effects, controlling for accumulated human capital and individual characteristics (as well as 208 territorial community clusters called *mahallas*).

The findings of this study have several important implications for educational policy, language planning, and future research. Practical implications relate to the role of linguistic capital in human capital development: the study adds to the growing body of research supporting the idea that both native and second language proficiency are not only cultural assets but also economic resources, especially in multilingual societies. Methodologically, the research supports the importance of integrating language variables into socioeconomic and educational datasets, which may improve the precision of policy-oriented studies and cross-country comparisons in the field of language economics and education. Practical implications include the need to support bilingual and multilingual education policies in Uzbekistan, particularly in regions where the use of the mother tongue enhances individual performance and promotes equal access to economic opportunities. Encouraging second language proficiency, especially in global languages such as English, or ethnic minorities' languages (such as Tajik and Kyrgyz) may contribute to improved employment outcomes and social mobility.

The structure of the article is as follows. Section 1 describes research methods and the empirical database used in this study to assess the impact of language competence on household income and academic attainment. In section 2, theoretical models of language as an economic institution are discussed with a review of the results of previous studies. Section 3 presents quantitative results of the econometric analysis of the impact of native and additional foreign languages on income and academic success in Uzbekistan. Section 4 summarises the main conclusions and provides practical recommendations.

2. MATERIAL AND METHODS

This study employs a quantitative research design based on primary microdata from the Household Budget Survey (HBS) conducted in Uzbekistan in 2021. The sample includes a nationally representative population, randomly selected across all regions, encompassing both urban and rural households (10,000 in total). The sample size was 10,000 respondents aged 18 to 60 years, including both native speakers of Uzbek and other languages (Russian, Karakalpak, Tajik, etc.). Only economically active individuals were included in the analysis.

The study is based on a detailed dataset containing information on respondents' income levels, educational attainment, language of communication, language competence (proficiency in a second and third language), place of residence, age, and demographic characteristics.

A cross-sectional design with a representative sample by region, type of settlement (208 mahallas), and age groups was used to calculate econometric estimates of regression analysis in the STATA package.

To test the research hypotheses, Ordinary Least Squares (OLS) with fixed effects regression analysis methods were used (to assess the impact of native and second-language proficiency and education on income and academic attainment) and logistic regression (to assess the probability of second-language proficiency), taking into account differences between groups by level of education, native language, and place of residence. To account for spatial and social heterogeneity, regional fixed effects and community-level (mahalla) cluster effects were included in the model, allowing for more accurate estimation of the relationship between language use and economic/educational outcomes.

To evaluate the impact of language competence on household income, the study applies the Mincerian earnings function, which models income as a function of years of education and other human capital indicators. Language variables are included as key explanatory factors, distinguishing between mother tongue fluency and proficiency in second languages (primarily Russian and English). The analysis uses log-linear income regressions for all regions of Uzbekistan, estimated via Ordinary Least Squares (OLS) with regional fixed effects, controlling for individual characteristics such as age, gender, education level, employment status, and membership in 208 territorial community clusters (mahallas). To analyse how knowledge of a second or multiple languages affects earnings, variables for knowledge of a second or multiple languages other than one's native language are included. An assessment was also made of whether the probability of knowing a second or third language would be higher for individuals with a high level of education, living in large regions, or being younger.

All statistical analyses were performed using robust standard errors to ensure the reliability of coefficient estimates. The methodological approach allows for causal interpretation under the assumption of conditional exogeneity and provides a framework for identifying policy-relevant language effects in multilingual developing contexts.

‘Language skills are considered in economic theory as part of human capital, along with education, work experience, and professional competencies. The theoretical foundations of language as an economic resource (microeconomic models of the ‘economics of language’) were first described by Marschak (1965), who formulated the concept of the ‘economics of language’ and defined language as an economic instrument for minimising the transaction costs of communication’

The following indicators were used as dependent variables: respondents’ income (in soums, logarithmic form), years of education (duration of study), and proficiency in a second and third language. The following variables were used as key explanatory variables: native language (dummy variable: Uzbek = 1, other = 0), education (years of study, categorical variables), age, gender, place of residence (region), as well as variables reflecting language competence (language of instruction, knowledge of a foreign language).

Tests for the significance of coefficients (t-statistics, p-value) and confidence intervals were used to test the statistical significance of the results of econometric estimations. Model diagnostics included testing for multicollinearity and stability of estimates (VIF tests), as a result, robust standard errors were used.

3. THEORETICAL BACKGROUND

The relationship between language skills and economic development remains one of the key topics within new institutional (macro) and behavioural (micro) economic theory. Research in this area demonstrates that language is not only a factor of social integration but also an important element in the formation of human capital, increasing labour productivity, stimulating innovation, and providing access to global markets.

Language skills are considered in economic theory as part of human capital, along with education, work experience, and professional competencies. The theoretical foundations of language as an economic resource (microeconomic models of the ‘economics of language’) were first described by Marschak (1965), who formulated the concept of the ‘economics of language’ and defined language as an economic instrument for minimising the transaction costs of communication. Rubinstein (2000), in his monograph *Economics and Language*, expanded on these ideas, presenting language as a coding system that influences the behaviour of agents under uncertainty. Further, Ginsburgh et al. (2007) developed a behavioural model of language choice in a multilingual society, according to which individuals tend to choose the language that maximises their future income – most often the language most widely used in the business environment. John (2016) emphasises that the market dynamics of languages result from market competition and institutional support for language processes: languages that promote economic opportunities displace ‘less economically advantageous’ languages if there is no institutional support for the latter.

Grin (2003) and Zhang and Grenier (2013) propose a classification of economic studies of language into two areas: (1) microeconomic analysis of the returns to language knowledge (including wages, employment, and migration); (2) macroeconomic analysis – the impact of language on economic growth, trade, and innovation.

In the macroeconomic context of human capital theory, Barro (1999) emphasises the importance of language skills as a foundation for acquiring other academic competencies and as a driver of economic growth. Language skills serve as a foundation for acquiring other knowledge and skills, which in the long run increases the income of both individuals and society.

Effective language policies that ensure multilingualism and support for native languages contribute to a more equitable distribution of economic opportunities, meaning that language policies can reduce or increase income inequality. Grin (2003) emphasises that societies with high levels of general language proficiency (including foreign languages) are more economically diversified and competitive. Subsequent research by Ginsburgh and Weber (2020) clarifies that language should be viewed not only as a means of communication, but also as an institution regulating access to resources. Thus, the inclusion of a language component in human capital development strategies can be an important step towards sustainable and inclusive economic growth, serving as a tool for reducing economic differentiation.

According to modern microeconomic and sociocultural theories, the language of instruction has a significant impact on academic achievement, cognitive development, and the subsequent ability to learn foreign languages.

First, education in the native language is considered a factor contributing to the formation of academic skills and cognitive development (Cummins, 1979, 2017). Cognitive Load Theory (Sweller, 2011) states that learning in an unfamiliar language can cause overload, especially if new educational content is introduced in parallel; a gradual transition from L1 to L2 reduces cognitive costs. Also, according to sociocultural theory (Vygotsky, 1978; Lantolf & Thorne, 2006) effective learning is possible when the language of instruction is understandable to the student, through which they achieve higher cognitive skills (promoting cognitive development) in the ‘zone of proximal development’.

Modern research studies confirm that instruction in the mother tongue contributes to better assimilation of educational material, formation of academic skills and the cognitive development of students (UNESCO, 2021; Thomas & Collier, 2012). UNESCO (2021) emphasises the importance of using the mother tongue in education as a tool for increasing enrolment, reducing dropout and moving towards sustainable development.

Secondly, education in the native language is considered not only an important factor in the formation of academic skills, improving academic performance, but also a basis for subsequent acquisition of a second language. This is confirmed by the cognitive load hypothesis (Sweller, 1988), according to which the transition to education in a second language without

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basic skills in the native language reduces effectiveness. The BICS vs CALP model (Cummins, 2008) argues that early instruction in the native language is necessary for successful CALP development, distinguishing between basic communicative skills (BICS) that develop over 1-2 years, and academic language competence (CALP) that develops over 5-7 years.

Many studies confirm that early instruction in the native language has a positive effect on academic achievement and subsequent second language acquisition (Thomas & Collier, 2012; Auger & Locke, 2019). However, despite the existence of valid models, important questions remain, particularly regarding regional differences and the role of educational level as a moderator of the language effect, which is the subject of this study.

3.1. Mother tongue, integration, and income

The study by Chiswick and Miller (1995) confirms that proficiency in the official language of the country of residence is a critical factor in successful employment, career advancement, and increased income. However, the mother tongue can also become a barrier if there is no access to quality education or employment in the official language. From another perspective, Laitin (2016) raises an important point: when government policies fail to provide access to quality education or employment in the official language, the mother tongue may become a barrier, leading to decreased income for these groups and increased social inequality.

In countries where access to quality education in native or global languages is limited, income gaps between social groups increase. Kennedy (2011) emphasises that an effective language policy should include support for native languages and a realistic bilingual education programme. Helliwell (1999) adds that language integration promotes trust and social cooperation, leading to a more equal distribution of income. Bruthiaux (2002) also notes that the mechanical incorporation of language into the education systems of developing countries, without creating conditions for effective acquisition, results in the economic and social marginalisation of large groups of the population.

3.2. Economic returns to foreign language proficiency

According to many studies, knowledge of a foreign (and especially a global language – English) increases labour mobility, ups its value and promotes integration into the global economy, and is directly related to an increase in wages. In countries with

transition economies, knowledge of English provides a significant income premium. Thus, a study by Mavisakalyan (2017) shows that in post-Soviet transition countries, proficiency in English can increase wages by 20-40% depending on the industry and level of education. Similar findings are made by Grenier and Zhang (2021), who emphasise that foreign language skills not only increase income but also serve as a marker of high qualifications and increase the chances of occupying positions that require interaction with international counterparts, increasing career mobility or social status (language competencies also act as a social elevator), especially in the private sector.

This is consistent with the findings of Rozhkova and Roshchin (2019), who found that positive returns on knowledge of English were also recorded in the Russian labour market. According to the research of these authors, knowledge of English in Russia provides a salary premium of 15% to 30%, depending on the sector. Moreover, the effect of additional income for native English speakers is more pronounced among younger workers and in sectors with a high share of foreign economic relations.

The situation is similar in the EU countries. Williams (2011) indicates that in multilingual countries of Western Europe (Belgium, Switzerland and Germany), knowledge of two or more languages is associated with consistently higher incomes.

3.3. Language of instruction and academic achievement

Research shows that the choice of language of instruction has a significant impact on students' basic academic skills and long-term economic prospects. Research confirms that: (a) mother tongue instruction in early school improves basic academic skills; (b) gradual bilingual transition preserves these benefits while building sought-after language competencies; (c) quality implementation depends on the training of staff and the availability of educational resources; (d) successful implementation requires well-designed language policies and institutional support.

According to UNESCO (2021), mother tongue instruction increases enrolment and reduces dropout rates, particularly in primary school, and the organisation recommends models of bilingual education with the gradual introduction of international languages. A longitudinal study of 40,000 US students (Thomas & Collier, 2012) found that dual-language immersion programmes (starting with instruction in the native language and gradually switching to the second language) provide better reading and mathematics results by high school. Auger and Locke (2019), analysing the results of PISA 2018, showed that late introduction of a second language (after grade 7) gives the best academic results by the age of 15, and early immersion requires high resource support for academic success. According to Cummins (2017), early instruction in the native language accelerates subsequent acquisition of subjects in L2.

Thus, the literature review shows that: (1) the native language affects income through access to education and the degree of social integration and mobility, while proficiency in the

official language is critical for access to skilled employment; (2) knowledge of a foreign language increases income and expands economic opportunities, and proficiency in English and other international languages increases competitiveness in the labour market and wage levels; (3) the language of instruction is a factor in academic performance: many studies also assess how the choice of language of instruction (native or foreign) affects students' academic performance and subsequent prospects. Instruction in the native language in elementary grades improves basic literacy and the assimilation of subject material, while a gradual transition to a foreign language in senior grades contributes to the formation of linguistic capital, which subsequently affects employment and income levels; (4) language policy can be an instrument of both social inclusion and institutional inequality, effective bilingual education programmes reduce income gaps, while unadapted ones cause marginalisation.

Despite established theoretical foundations, the literature continues to raise a number of controversial issues, giving rise to the following research questions.

1. To what extent does the native language influence not only academic performance, but also subsequent economic outcomes – income level and social mobility? The literature shows contextual variability (contradictory results) in the returns to native language proficiency across countries and regions, arising from local socio-economic conditions (differences in the institutional environment, labour market structure, and educational policies). There is a lack of studies that simultaneously analyse returns to language in the form of an income premium and academic achievement measured by years of education.

2. How does native language proficiency affect the ability to learn foreign languages? Existing studies often focus on monolingual and bilingual effects, but the mechanisms of language transmission in the educational system, especially in the post-Soviet context, remain poorly understood.

3. Does the return on foreign language proficiency operate in the context of increasing educational attainment and regional heterogeneity? Empirical evidence from post-Soviet countries is limited, and most existing data are either aggregated or do not take into account important moderators such as educational attainment, age, and urbanisation. This is especially relevant for countries with a multilingual population and pronounced regional differences, such as Uzbekistan.

To answer these research questions, this study formulates and tests two main hypotheses. Hypothesis 1 is that education in the native language contributes to the growth of human capital by increasing students' academic achievement, which, in turn, leads to higher income. Hypothesis 2 is that proficiency in the native language facilitates the successful learning of a second language, knowledge of which provides a significant income premium. In this regard, an assessment was conducted to determine whether the likelihood of mastering a second and third language increases among young people who speak Uzbek as their native language, as well as among individuals with higher levels of education and those living in cities.

The novelty of this study lies in its focus on a transition economy. Using the example of Uzbekistan, it offers a cross-sectional analysis comparing the economic and academic returns to education in the native language and measures the 'premium' for a second language (L2) in different regions (the second language proficiency effect). In addition, the study traces how language competence correlates with territorial differences in opportunities and returns to education. Also, the study clarifies the role of the native language as a basis for mastering global languages, which has practical implications for language policy, education strategies and the formation of inclusive growth models.

4. STUDY RESULTS

A consistent finding across studies on the impact of language proficiency on income is that knowledge of the country's dominant language yields substantial economic returns (Chiswick & Miller, 2015; Dustmann & Soest, 2001). In particular, in many European countries, individuals who are fluent in the dominant language (such as English, German or Hebrew) earn approximately 10-20% more than those who lack fluency (the income advantage is around 10-20%). According to UNESCO (Wisbey, 2017), mother tongue-based education (MTB, educational programmes with instruction in the native language), which provides opportunities to learn in the languages that are commonly spoken at home with family members, not only supports individuals' future development but also fosters the development of greater self-confidence. Mother tongue education enhances literacy and educational achievement, including improved access to higher education, greater economic productivity and competitiveness. Also, countries that place more emphasis on local languages tend to experience stronger social progress, increased mobility, and the development of human capital.

Overall, linguistic competencies alongside other skills are an element of human capital. From an economic perspective, they provide access to various markets (including the labour market and markets for goods and information) and enable individuals to engage more effectively and profitably with other people and organisations.

To analyse how education in the native language and knowledge of other languages affects earnings in Uzbekistan, and to assess the probability that knowledge of the second and third languages is higher among individuals with a high level of education, living in large regions or at a young age, we test the corresponding Hypothesis 1.

Hypothesis 1. Education in the native language improves learning outcomes and academic success and leads to an increase in human capital and income earnings.

To assess the current level of return on a particular native language in Uzbekistan, we estimate the education duration and income level depending on the respondent's native language (Tables 1 and 2). In Table 1, the assessment results do not support, at the 5% significance level, the idea that native language increases overall educational success, including the ability to more freely obtain higher education.

Table 1

Assessment of the impact of native language proficiency on the likelihood of access to higher education

Linear regression Number of obs = 8473						
F(4, 207) = 1453.52						
Prob > F = 0.0000						
R-squared = 0.5401						
Root MSE = 1.2301						
edu_years	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
age	.455109	.0060204	75.59	0.000	.4432399	.4669781
gender	-.0214687	.0254999	-0.84	0.401	-.0717415	.0288041
language_native	.0066285	.0035792	1.85	0.065	-.0004279	.0136849
province	.0018405	.0057916	0.32	0.751	-.0095777	.0132586
_cons	1.977742	.6470394	0.33	0.003	.7021101	3.253374

Source: Author's calculations based on sample data from a survey of household budgets in Uzbekistan

Economic research has shown that an important investment in human capital is learning a country's dominant language and that fluency in a country's dominant language provides advantages in the labour market and is important for its economic

success. The results in Table 2 show that the return on income for respondents with Uzbek as their native language is not statistically significantly higher than that for respondents with other native languages.

Table 2

The influence of native language on income level

Linear regression Number of obs = 5.998						
F(5, 207) = 169.61						
Prob > F = 0.0000						
R-squared = 0.1642						
Root MSE = .62132						
ln_hired_wage	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
edu_years	.0879776	.0067342	13.06	0.000	.0747011	.1012541
age	.0042314	.0008617	4.91	0.000	.0025326	.0059303
gender	-.4772029	.0242917	-19.64	0.000	-.5250937	-.429312
language_native	-.0019727	.0017764	-1.11	0.268	-.0054749	.0015294

Table 2
The influence of native language on income level (continued)

province	.0186862	.0051795	3.61	0.000	.0084749	.0288976
_cons	14.21138	.53961	26.34	0.000	13.14754	15.27522

Source: Author's calculations based on sample data from a survey of household budgets in Uzbekistan

Thus, the analysis of the dependence of the duration of education (or education attainment level) and income level in Uzbekistan on the native language of respondents (Tables 1 and 2) shows that the form of education in the native language has no significant effect on educational achievements, including access to higher education (according to Table 1) and native speakers of the Uzbek language do not receive a statistically significant advantage in income compared to other groups (Table 2 shows that the economic return on education for native speakers of the Uzbek language is not statistically higher than for native speakers of other languages). This underlines the importance of taking language factors into account in educational and economic policies.

Moreover, the dominance of one language can lead to negative wage premiums, especially if there are differences in the quality of education offered in different languages (Aldashev & Danzer, 2020). Therefore, Uzbekistan needs to strive to enhance quality and enrich the scientific baggage in its native language and disseminate globally accessible knowledge through mass translation into Uzbek.

It is worth noting, however, that the costs of providing linguistic diversity are relatively low. For example, providing bilingual education may increase the cost of education by 4-5% compared to the cost of monolingual education, mainly due to the additional teaching materials and teacher training required (Grin, 2003). However, this seems to be a burden that must be accepted in order to pass on language and knowledge to the next generation.

Hypothesis 2. Knowledge of the native language facilitates learning a foreign (second) language, which in turn leads to an increase in wage premiums (from knowledge of the second language).

Knowledge of a foreign language constitutes an important component of human capital, and the returns to this skill in international labour markets have been extensively studied. Positive economic returns on knowledge of a foreign language are confirmed in various countries. In Switzerland, such knowledge can be rewarded with a significant bonus (12-30%) in salary. In developing countries, such as Vietnam, it is even higher – 40-60%.

In Europe, the most consistent impact on income is demonstrated by proficiency in widely used foreign languages such as English and German. The degree of impact depends on the prevalence of the language in a given labour market. For example, in Austria, where almost half of the population speaks English as a second language, the return is 11%, while in Spain, where

English proficiency is less common, it is 39%. The return on fluency in English in Germany is about 12%, provided the language is used in the workplace. Using a large European dataset, a study of the impact of foreign language skills on unemployment (focusing on natives, not immigrants) showed that knowledge of a foreign language reduces the likelihood of unemployment by at least 3.4 percentage points.

The results have also demonstrated that using a second language in the workplace increases earnings by 3-5% in some Western European countries, and even more in others (Williams, 2011).

A study on the wage effects of foreign language proficiency in the Russian labour market found that the return is 9% when controlling for job characteristics, while the return on fluent proficiency is 24%, which significantly exceeds the return on lower proficiency levels (Rozhkova & Roshchin, 2019). It is usually difficult to separate the premium for formal education from the premium for language proficiency, since foreign language learning occurs mainly within the framework of education. When controlling for education, the premium for language proficiency in Russia is 8%. Without this control, the coefficient for the variable almost doubles (in other words, with education included in the model, the wage premium was 8%; without it – almost 24%).

Another study has demonstrated that the return on knowledge of a foreign language in Russia yields a 'solid premium' in terms of earnings – about 11% (Kapelyushnikov & Lukyanova, 2010).

Uzbekistan ranks very low in terms of proficiency in the main language of international communication – English – placing 98th out of 116 countries in the EF English Proficiency Index (EF EPI) compiled by EF Education First. EF EPI is a global assessment of working-age adults using a common methodology to measure English proficiency levels. In 2024, Uzbekistan scored 439 points, which corresponds to the category of 'very low proficiency' – the lower half of level B1 according to the Common European Framework of Reference (CEFR).

An assessment of the return on each year of education across all regions of Uzbekistan (Table 3) showed that wage gains amount to 8.7%, compared to up to 12.5% per year of study reported in a previous study of one region – Jizzakh (Ibragimova, 2022a, 2022b). The inclusion of variables measuring proficiency in a second (or third) language (Table 3) further indicates that second- or foreign-language proficiency is critical for career development and yields higher economic returns for individuals who actively use languages other than their native Uzbek.

Table 3

Estimated return on income, bonuses for higher education and knowledge of the second and third language

Linear regression Number of obs = 4,187						
F(7, 8) = .						
Prob > F = .						
R-squared = 0.1385						
Root MSE = .63256						
ln_hired_wage	Coef.	Robust Std. Err.	t	P> t	[95% Conf.	Interval]
edu_years	.0872301	.002646	32.97	0.000	.0811284	.0933319
age	.0020256	.0004492	4.51	0.002	.0009897	.0030615
gender	-.455107	.0140638	-32.36	0.000	-.4875382	-.4226758
language_second						
Karakalpak	.1185788	.031073	3.82	0.005	.0469244	.1902332
Tajik	.0893055	.0320731	2.78	0.024	.0153448	.1632662
Russian	.0559556	.0341793	1.64	0.140	-.022862	.1347732
Kazak	-.1438056	.0523531	-2.75	0.025	-.264532	-.0230793
Kyrgyz	.0917579	.0325083	2.82	0.022	.0167936	.1667222
Tatar	.0637662	.034954	1.82	0.106	-.0168379	.1443702
Turkmen	-.0793269	.0321156	-2.47	0.039	-.1533857	-.0052681
Farsi	-.0114107	.0741417	-0.15	0.881	-.1823818	.1595603
English	.1628677	.0316527	5.15	0.001	.0898764	.235859
Other	-.0294955	.0320606	-0.92	0.384	-.1034275	.0444364
province	.0179986	.0020298	8.87	0.000	.0133178	.0226793
_cons	14.33497	.2432744	58.93	0.000	13.77398	14.89596

Source: Author's calculations based on sample data from a survey of household budgets in Uzbekistan

The highest premiums are observed for knowledge of such second languages as English (16.3%), Karakalpak (11.8%), and Kyrgyz (9.2%). (Knowledge of a second language refers to its use in the workplace or in everyday activities.)

It is worth noting that, both taking into account the level of education and without it, the premium for knowledge of the second and third language can be up to 10-20% (Table 3 and Table 4). That is, despite the fact that learning a second, etc.

language occurs mainly within the framework of education, when excluding the variable premium for formal education years (i.e., without control for the level of education) the premium for knowledge of an additional language (the coefficient for the variable of the second language) does not change significantly, i.e. these two types of premiums can be easily separated. The latter may indicate a weak study of the second and third languages within the existing education system.

Table 4
Estimated returns to income and premiums for second language proficiency (without controlling for the variable of higher education level)

Linear regression Number of obs = 4,187						
F(7, 8) = .						
Prob > F = .						
R-squared = 0.1006						
Root MSE = .64626						
ln_hired_wage	Coef.	Robust Std. Err.	t	P> t	[95% Conf. Interval]	
age	.0017257	.0003767	4.58	0.002	.000857	.0025944
gender	-.4769774	.016669	-28.61	0.000	-.5154161	-.4385387
language_second						
Karalkalpak	.1180557	.0415867	2.84	0.022	.0221567	.2139548
Tajik	.067656	.0386811	1.75	0.118	-.0215427	.1568548
Russian	.045784	.0390129	1.17	0.274	-.0441799	.1357479
Kazak	-.157042	.0363358	-4.32	0.003	-.2408326	-.0732514
Kyrgyz	.048068	.0390715	1.23	0.254	-.042031	.1381669
Tatar	.018752	.0408503	0.46	0.658	-.075449	.1129529
Turkmen	-.1466011	.0389808	-3.76	0.006	-.236491	-.0567111
Farsi	.1397817	.161612	0.86	0.412	-.2328962	.5124597
English	.1881069	.0393122	4.78	0.001	.0974529	.2787609
Other	-.0561489	.0392128	-1.43	0.190	-.1465737	.0342759
province	.0206503	.0029944	6.90	0.000	.0137454	.0275553
_cons	15.13411	.3182042	47.56	0.000	14.40033	15.86789

Source: Author's calculations based on sample data from a survey of household budgets in Uzbekistan

When learning a new (second or third) language, the skills acquired in learning to spell and read in the native language are transferred. If an individual cannot read or write in their native language, it may be difficult for them to learn to read in a second language. In general, the more educated a person is, the more effectively they learn a language (Chiswick & Miller, 2015).

Therefore, an assessment was also made of whether the probability of proficiency in a second (or third) language is higher among young native Uzbek speakers living in Tashkent and among individuals with a high level of education (Table 5).

The results show that knowledge of the native language increases the probability of mastering other languages. The probability of mastering a second and third language is higher among young people, those who have received secondary general or higher education, and those living in large cities.

Language policy should therefore focus on systematically expanding bilingual and trilingual education opportunities for youth, gradually scaling successful urban language programmes to other regions of the country, and embedding advanced language training into both school and university curricula.

Table 5
The influence of higher education, age, and region of residence on multilingualism

Linear regression Number of obs = 4.755						
F(18, 198) = 13.80						
Prob > F = 0.0000						
R-squared = 0.0245						
Root MSE = 4.0814						
language_second	Coef.	Robust Std. Err.	t	P> t	[95% Conf.	Interval]
edu_highest	.1724006	.0924941	1.86	0.064	-.0099993	.3548005
language_native	.0080266	.0030547	2.63	0.009	.0020027	.0140505
language_third	.0031707	.006193	0.51	0.609	-.009042	.0153833
age	-.007793	.0030606	-2.55	0.012	-.0138286	-.0017574
gender	.0100092	.119731	0.08	0.933	-.2261024	.2461209
province						
Andijan region	1.797885	.6534913	2.75	0.006	.5091883	3.086581
Bukhara region	.4052873	.1334089	3.04	0.003	.1422026	.668372
Jizzakh region	1.262542	.1737869	7.26	0.000	.9198312	1.605253
Kashkadarya region	2.207658	.6949456	3.18	0.002	.8372129	3.578103
Navoi region	1.214893	.1545006	7.86	0.000	.9102151	1.519571
Namangan region	1.153424	.1618229	7.13	0.000	.8343063	1.472541
Samarkand region	.6654023	.1780815	3.74	0.000	.3142225	1.016582
Surkhandarya region	.8228201	.1678918	4.90	0.000	.4917346	1.153906
Syrdarya region	1.133975	.1834083	6.18	0.000	.7722905	1.495659
Tashkent region	1.956465	.2911965	6.72	0.000	1.38222	2.53071
Fergana region	1.839297	.426399	4.31	0.000	.9984312	2.680164
Khorezm region	1.092219	.1473352	7.41	0.000	.8016711	1.382767
Tashkent city	1.124404	.1407163	7.99	0.000	.8469092	1.401899
_cons	1.867229	.7902951	2.36	0.019	.308753	3.425705

Source: Author's calculations based on sample data from a survey of household budgets in Uzbekistan

'First, the estimation results showed that the level of return on education and income for respondents with native Uzbek language is currently still not statistically significantly higher than the level of return on education of respondents in other languages. The estimates also show that using a second language increases income levels (English – by 16.3%, Karakalpak – by 11.8%, Kyrgyz – by 9.2%), even when controlling for education and other demographic variables, increasing earnings by 10–20% on average'

Overall, these study results confirm that linguistic proficiency is a key dimension of human capital in a multilingual society.

First, the estimation results showed that the level of return on education and income for respondents with native Uzbek language is currently still not statistically significantly higher than the level of return on education of respondents in other languages. The estimates also show that using a second language increases income levels (English – by 16.3%, Karakalpak – by 11.8%, Kyrgyz – by 9.2%), even when controlling for education and other demographic variables, increasing earnings by 10–20% on average. Regional dummies are very strong (coefficients >1 for many provinces), suggesting location effects dominate (Tashkent, Samarkand). This indicates that place of residence (urban versus regional context) constitutes a key determinant of income levels, alongside language skills and educational attainment. To reduce regional disparities, targeted scholarships and online learning initiatives are needed to provide rural populations with equitable access to multilingual education, thereby fostering human capital and improving labour market outcomes. These findings underscore the need to support bilingual and multilingual education strategies that promoting second language acquisition. Therefore, national education and employment policies should consider language proficiency as a measurable and actionable factor contributing to individual and collective well-being.

In sum, the research confirms that language is not only a medium of communication or cultural identity but also a form of capital that shapes economic opportunities. Recognising and investing in this capital is vital for inclusive and sustainable development in Uzbekistan and beyond.

5. DISCUSSION

The obtained results check the proposed research hypotheses and allow us to take a new look at the relationship between language, education and economic opportunities in the context of multilingual society in Uzbekistan.

Hypothesis 1 has not received empirical confirmation. Education in the dominant native language does not indeed contribute to better assimilation of educational material, academic success and the formation of human capital. These findings are inconsistent with the theoretical models of Vygotsky's (1978)

sociocultural theory, Sweller's (2011) cognitive theory, according to which the native language provides a cognitive basis for the successful acquisition of more complex academic knowledge.

In accordance with Hypothesis 2, native language proficiency increases the likelihood of successful learning of a second (and even third) language. This confirms the theoretical hypothesis of interdependence of languages (Cummin's (2008) BICS/CALP theory), whereby the skills formed in L1 are transferred and contribute to the development of L2. Thus, knowledge of the native language is not an obstacle, but on the contrary, a foundation for the formation of multilingual competencies.

The obtained estimates in line with Hypothesis 3 show that competence in a second language (most often English, Karakalpak, Kyrgyz) is associated with a wage premium of 10–20%, especially in economically active regions such as Tashkent and Samarkand, where proficiency in a second language increases average incomes by 25–30%. This result highlights the role of language skills as an element of human capital: the effect of the 'premium' for a second language is consistent with the theory of 'returns to language capital' presented in the works of Ginsburgh and Weber (2020) and coincides with estimates for transition economies (Mavisakalyan, 2017). Such estimates are also confirmed in the Russian context: Rozhkova and Roshchin (2019) report a 15–30% premium for knowledge of English. Whereas regional peaks in the capital and cultural centres (Tashkent, Samarkand) reflect a higher concentration of international business and the tourism industry, emphasising the economic value of multilingualism in an open market.

However, an important clarification is that so far the level of returns to education for native Uzbek speakers (Hypothesis 1) is not statistically significantly higher than for other language groups (it is not statistically different from the returns for graduates with instruction in other languages). This is consistent with the findings of Grenier and Zhang (2021), who note that, given the same level of programme standards, returns to education do not depend on the language of instruction. However, unlike some Western European countries (Williams, 2011), where returns to native and second languages can vary significantly, in Uzbekistan there is a relative homogeneity of returns to education regardless of the language of instruction. At the same time, it points to existing barriers that prevent the full realisation of the advantages of the native language – possibly due to insufficient coverage of quality education in the Uzbek language.

Thus, the study contributes to the growing field of language economics by demonstrating that second language competence function as measurable, productivity-enhancing assets within the labour market and educational systems. The results of this study offer important implications at the policy and methodological levels.

Methodologically, this research underscores the value of integrating national household surveys and language variables into further microeconomic and sociolinguistic studies in multilingual countries. The study employs a replicable model approach for examining how language skills intersect with human

'Methodologically, this research underscores the value of integrating national household surveys and language variables into further microeconomic and sociolinguistic studies in multilingual countries. The study employs a replicable model approach for examining how language skills intersect with human capital accumulation by leveraging regionally disaggregated individual data. This approach can be used in applying log-linear income regressions with fixed effects at the linguistic group and mahalla (community) level'

capital accumulation by leveraging regionally disaggregated individual data. This approach can be used in applying log-linear income regressions with fixed effects at the linguistic group and mahalla (community) level.

At the policy level, the findings support the need to strengthen bilingual education and promote second language learning as a factor of socioeconomic advancement in Uzbekistan. The observed income and academic returns to proficiency in non-native languages suggest that language skills serve as a key element of human capital. Language-sensitive educational policies – particularly those that support multilingual learning environments in regional and ethnolinguistically diverse contexts – may contribute to greater social inclusion and economic mobility.

The findings highlight the need for a balanced language policy that supports the native language while creating conditions for effective bilingual education. Based on the empirical findings obtained, the following recommendations for improving language policy and educational programmes are proposed for improving language policy and educational programmes in the country.

1. Expanding support for mother tongue curriculum development and teacher training at the primary and secondary levels is essential. Although mother-tongue education has not yet consistently demonstrated positive effects on academic outcomes, it is recommended to invest in the development of curricula and training of teachers for primary and secondary education to teach in the mother tongue (Uzbek and other ethnic minorities' native languages of Uzbekistan). Strengthening instruction in Uzbek and minority languages can provide a stronger foundation for learning and foster equity.

2. Integrating the mother tongue into the multilingual education strategy. The second research hypothesis confirmed that proficiency in the mother tongue increases the likelihood of mastering the second and third languages.

Therefore, it is necessary to adapt foreign language teaching methods taking into account the linguistic base of L1 (with the mother tongue as a support); institutionally support the development of bilingual education, starting with the mother tongue and with a gradual transition to teaching in international languages. Gradual bilingual transition models (L1 → L2) should

be implemented without compromising academic performance: when designing a language education strategy (trajectory), a solid foundation should be laid in the mother tongue before moving on to teaching in foreign languages.

The results also show that, although learning a second (or additional) language occurs mainly within the framework of formal education, two types of premiums – those associated with years of education and those linked to knowledge of an additional language – can be clearly distinguished. The latter may indicate a weak study of the second and third languages within the existing education system. This may indicate that the current education system provides insufficient opportunities for effective learning of second and third languages, which limits students' ability to fully benefit from the wage premiums associated with multilingualism.

3. Reducing regional inequalities in language and educational access. According to the findings, the language premium (income effect of language proficiency) is stronger in active regions such as Tashkent and Samarkand. To enhance language policy and reduce regional inequalities, it is recommended to expand bilingual and trilingual education for youth, strengthen language programmes in major cities and extend best practices to other regions, integrate advanced language training into school and university curricula, provide scholarships and incentives for mastering additional languages, and ensure equitable access for rural populations through online and distance learning platforms. To reduce the regional gap, it is recommended to expand language education programmes in rural and remote areas, especially with a focus on teaching foreign languages: ensure equal access to quality language courses and resources regardless of place of residence, introduce online courses and digital platforms for language learning in sparsely populated regions.

4. Increasing the economic return on language education. Since the use of a second language increases income by 10-20% on average, it is necessary to expand the integration of second language training into vocational and higher education programmes, take into account the language education component in the preparation of state employment programmes, human capital development and youth policy, increase motivation for young people to study foreign languages, especially in cities and among students with a high level of education, encourage multilingualism in the private sector, including bonuses for knowledge and use of foreign languages.

Given the impact of language on access to economic opportunities, it is necessary to monitor and analyse the impact of language inequality on educational (number of years of education, results of international education quality tests such as PISA, TIMSS, etc.) and economic indicators (include monitoring of language inequality and its impact on income in government statistics).

Some limitations of the study should be acknowledged. First, the data are based on a cross-sectional 2021 household budget survey in Uzbekistan, which does not allow to assess the dynamic trend of changes in returns over time. Second, in this

study due to data availability limitations, endogeneity concerns (for example, whether higher income enables language learning rather than the reverse) are not addressed (GMM estimations are possible only with longitudinal data). Third, the sample may have been biased towards urbanised areas, where access to a second language is higher. In addition, research did not analyse the impact of the quality of teaching and methods of teaching a second language, which could clarify the cause of regional differences.

Future research directions include longitudinal monitoring of graduates from different language programmes to assess long-term effects, as well as comparative analysis of bilingual education models (e.g., immersion programmes vs. elective education). It is also important to examine the impact of teacher training and the availability of specialised methodologies on the effectiveness of second-language instruction across different regions of the country.

6. CONCLUSION

Language skills are an important component of human capital, which has a direct and indirect impact on the person's income and achievements. Language not only facilitates access to education and information, but also affects employment opportunities, mobility, labour productivity and inclusion in economic processes. In the context of globalisation, the role of both a foreign and native language is becoming increasingly important, especially in transition economies and countries with a high level of linguistic diversity. Today language is not only a tool of communication and economic differentiation, but also a key component of educational strategies that influence academic achievement and, as a result, the future income of the population. Given the growing role of labour mobility and international business, attention to language policy and educational infrastructure is becoming an important element of sustainable development.

The study by Alhendi et al. (2021) covers the analysis of 99 countries and demonstrates a statistically significant relationship between the level of language proficiency, the quality of education and regional economic growth. The authors emphasise that multilingualism and access to education in international languages (primarily English) enhance integration into the global economy. Countries with high linguistic diversity but well-organised language policies have more balanced regional development.

The aspect is the quality of teaching in a foreign language. Zhang and Grenier (2013) emphasise that the success of such programmes is largely determined by the training of teachers and the availability of teaching materials adapted for bilingual classes. Low teacher qualifications and a lack of adapted textbooks can offset the benefits of early introduction of a foreign language, reducing student motivation and their academic performance. Laitin (2016) also raises an important question about how language affects human development: in countries with a dominant official language and weak support for minorities, language policy can become an instrument of exclusion.

Finally, language policies at the national level provide the framework for the implementation of effective educational strategies. Kennedy (2011) points out that without institutional support (funding for teacher training, developing methods, creating bilingual schools), even well-designed programmes can face resistance and low achievement.

This study aimed to identify the status of the native language and the role of language skills in shaping economic and academic outcomes for the individuals in Uzbekistan, using nationally representative data and an established human capital framework. In Uzbekistan, where the population is linguistically diverse and educational opportunities vary greatly across regions, the impact of language use on income and academic achievement has not been systematically quantified.

The hypotheses of this study are built on the several theoretical foundations. This study employs existing models of language economics and human capital and emphasises the specificity of the language factor of increasing income and academic achievement in the context of a transition economy by adding empirical data on the relationship between native and foreign languages, education duration and economic outcomes in a multilingual society.

More specifically, this study provides empirical support for the idea that linguistic proficiency functions as a distinct and complementary form of capital within the framework of educational and labour market theory. Using microdata from the 2021 Household Budget Survey and applying the well-established models (Marschak, 1965; Rubinstein, 2000; Grin, 2003) and the Mincer earnings function with regional fixed effects, the analysis revealed that language skills significantly affect income levels.

Thus, the contribution to the development of the theory consists in the refinement of the L1/L2 balance for the transition economy: we show that in Uzbekistan, education in the native language (L1) is not inferior in terms of returns, and proficiency in the second language (L2) provides an additional bonus (premium) – knowledge of the second language increases income (and in regions such as Tashkent and Samarkand – even higher), which confirms the economic effect of linguistic capital. The results also confirm that knowledge of the native language increases the likelihood of mastering a second and third language, especially among young people, people with a high level of education and residents of large cities.

The study provides new empirical evidence on the socioeconomic consequences of language use, contributing to the broader literature on linguistic capital and educational inequality. The new result of this work is a more precise estimate of the homogeneity of returns to education regardless of the language of instruction in Uzbekistan (for native Uzbek speakers, the returns are not statistically significantly different from those of graduates with instruction in other languages) and evidence of regional differences in the 'premium' for a second language (proficiency in a second language, mostly English, brings an additional premium to earnings of an average of 10-20%, reaching 25-30% in large regions).

The study also integrated micro- and macro-level methodological approaches, which demonstrated how individual language skills relate to regional characteristics of economic activity and policy. The inclusion of community-level fixed effects (mahalla clusters) together with controls for accumulated human capital illustrates the potential of combining socioeconomic and linguistic variables in national household surveys.

The practical significance of the work is that language policies in the field of education can rely on the empirical results when developing bilingual education programmes and improving the quality of teacher training. Overall, the study suggests that a balanced language policy is needed – one that strengthens

the role of the native language in education while simultaneously expanding access to second language learning to improve social and economic outcomes.

However, the results obtained show that the return to education among Uzbek speakers is not statistically higher than the return among other groups, which indicates the need for further analysis of institutional factors (quality of education, availability of infrastructure for study, access to the labour market, etc.). This opens the way for further research, for example, a longitudinal analysis of the career trajectories of graduates of bilingual programmes and a comparative study of different models for introducing a second language into the educational process.

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Original Research

Content-based instruction for psychology majors: Issues and solutions for ESP curriculum development

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English for Specific Purposes (ESP) has been widely integrated into higher education, but psychology has not yet received systematic attention within this framework. Existing courses tend to emphasise general academic skills and simplified texts, leaving a gap in provision of instruction consistent with the communicative practices of the discipline. The purpose of this article is to determine the potential of content-based instruction (CBI) to establish a structured approach to integrating language study with psychology-specific discourse, while identifying obstacles that arise in curriculum design. The study used a qualitative comparative methodology that combined text and genre analysis with curriculum audit. A corpus of fifty psychology texts comprising research articles, case reports, ethical documents, and poster guidelines was analysed for rhetorical organisation, lexical clusters, modality, and multimodal features. These findings were systematically compared with the contents of an existing ESP syllabus and textbook for psychology majors. The analysis showed that psychology requires competence in genres ranging from empirical reporting and diagnostic narration to ethically binding documentation and multimodal dissemination. In contrast, the curriculum reviewed concentrated on essays, oral presentations, and general vocabulary lists, with little exposure to authentic disciplinary texts. The results demonstrate a substantial gap between disciplinary requirements and current practice. The study argues that CBI provides a viable framework for addressing this misalignment by extending genre coverage, incorporating unadapted texts, integrating multimodal tasks, and focusing on discipline-specific lexis. The implications are pedagogical and institutional, calling for closer collaboration between language instructors and psychology faculty to bring ESP provision into correspondence with professional training.

KEYWORDS: *English for Specific Purposes, content-based instruction, CBI, psychology major, genre analysis, curriculum design, multimodality*

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1. INTRODUCTION

The role and place of English for Specific Purposes (ESP) in higher education has been expanding steadily over the past decades and reflects the growing demand for graduates who can operate effectively in internationalised academic and professional

environments. ESP instruction emphasises the development of language skills tailored to specific disciplinary and occupational domains, thereby enabling learners to communicate in English and to engage meaningfully with the conceptual and methodological frameworks of their fields. Within this paradigm, content-

‘Students majoring in psychology represent a distinct group with specific linguistic and professional requirements that differentiate them from learners in other academic fields. Their training entails consistent engagement with academic literature, empirical research reports, diagnostic manuals, case studies, and professional communication scenarios, all of which are linguistically and cognitively demanding. Unlike students in medicine, who often focus on highly standardised terminologies and procedural communication, or those in business studies, who concentrate on negotiation and persuasive discourse, psychology students are required to master the interpretive and descriptive modes of academic communication as well as the interpersonal, ethically sensitive discourse of clinical and counselling contexts’

based instruction (CBI) has emerged as a pedagogical approach of particular relevance, as it integrates the acquisition of subject matter knowledge with the simultaneous development of language competence. Such integration is especially pertinent in disciplines where professional practice is heavily reliant on specialised terminology, discourse genres, and modes of reasoning.

Psychology constitutes one of these disciplines. Students majoring in psychology represent a distinct group with specific linguistic and professional requirements that differentiate them from learners in other academic fields. Their training entails consistent engagement with academic literature, empirical research reports, diagnostic manuals, case studies, and professional communication scenarios, all of which are linguistically and cognitively demanding. Unlike students in medicine, who often focus on highly standardised terminologies and procedural communication, or those in business studies, who concentrate on negotiation and persuasive discourse, psychology students are required to master the interpretive and descriptive modes of academic communication as well as the interpersonal, ethically sensitive discourse of clinical and counselling contexts. These requirements necessitate an ESP curriculum that develops general academic skills such as reading comprehension and academic writing and equips learners with the ability to handle discipline-specific genres, terminologies, and communicative practices.

Despite the evident importance of tailoring ESP curricula to psychology majors, existing instructional models often fail to adequately align language training with the epistemological and professional characteristics of the discipline. General ESP courses in the humanities and social sciences tend to emphasise transferable academic skills, while subject-specific curricula are more commonly developed for fields such as medicine, engineering, or law, which have longer traditions of ESP scholarship. For psychology, the consequence is a persistent mismatch between curricular design and the actual communicative demands that

students face in their academic studies and future professional practice. Among the most salient challenges are the scarcity of authentic materials adapted for pedagogical use, the difficulty of balancing cognitive load between disciplinary content and language acquisition, and the limited preparedness of language instructors who may lack a background in psychology.

The present study addresses the challenges outlined above by posing the following research question: How can CBI be effectively applied to the ESP curriculum for psychology majors, and what issues and solutions emerge in the process? The purpose of the article is to examine the potential of CBI to provide a systematic framework for integrating language learning with disciplinary content in psychology, while also identifying the obstacles that may arise in curriculum design and implementation.

The novelty of this research lies in its disciplinary focus. While the application of ESP and CBI methodologies has been widely explored in professional fields with clear communicative conventions, psychology remains comparatively underrepresented in the literature. Studies that do address psychology students’ needs often do so in fragmentary ways, as they focus on vocabulary development or general academic writing skills rather than the construction of comprehensive curricular solutions. This study intends to develop a systematic account of issues and solutions specific to ESP for psychology majors to contribute both to the field of applied linguistics and to the practice of curriculum development in higher education.

2. THEORETICAL BACKGROUND

2.1. ESP and CBI

English for Specific Purposes (ESP) is grounded in the premise that language learning is inseparable from disciplinary participation and communicative purpose. Recent overviews emphasise that ESP has moved beyond lists of specialist lexis toward modelling the discourse, practices, and identities of knowledge communities, with course aims derived from concrete analyses of target settings and genres rather than generic proficiency scales. This shift is visible in contemporary syntheses that foreground disciplinary literacies, genre knowledge, and situated assessment as core ESP concerns (Hyland, 2022; Akopova, 2024).

Within this paradigm, CBI positions disciplinary knowledge as both the vehicle and the objective of language learning. Foundational work framed CBI as a curriculum stance rather than a method, specifying design principles (e.g., sequencing around content topics, using authentic texts, aligning assessment with content tasks) and warning against ‘language-through-osmosis’ assumptions (Stoller, 2004). Subsequent accounts systematised teacher moves (raising form awareness without derailing content learning) and proposed design heuristics (e.g., the *Six Ts* of themes, topics, texts, tasks, transitions, and threads) (Lyster, 2017). CBI thus provides a theoretically coherent route for ESP to couple language outcomes with disciplinary participation.

At the same time, slippage between CBI and Content and Language Integrated Learning (CLIL) has generated conceptual ambiguities that matter for higher-education ESP. Comparative analyses argue that while both are dual-focus, CLIL is typically system-level (often programme-wide or institutionally mandated) whereas CBI is course-level and instructor-mediated; CLIL often prioritises content objectives with language support, whereas CBI tends to articulate language objectives explicitly alongside content (Cenoz, 2015). Meta-analytic evidence indicates that integrated approaches yield sizeable gains in language development relative to non-integrated instruction, but effect sizes vary with age, program model, and outcome measures – critical variables when extrapolating findings to domain-specific ESP at university level (Lee et al., 2023; Grishechko, 2023).

A second long-running debate concerns authenticity. Early ESP work equated authenticity with unedited professional texts, but more recent critiques differentiate product authenticity (provenance of materials) from process and task authenticity (the uptake, purposes, and social consequences of classroom activity) (Gilmore, 2007). Under this view, authenticity is achieved when learners engage with ‘real’ disciplinary problems, roles, and audiences (even when texts are adapted), thereby aligning with motivation, identity investment, and transfer (Gilmore, 2019). Studies of communicative environments in specific cultural contexts further illustrate how authenticity is shaped not only by textual provenance but also by the socio-pragmatic realities of learners’ environments (Namrueva & Petrulovich, 2015). For ESP course design, this reorientation justifies purposeful scaffolding of domain materials to balance comprehensibility with epistemic fidelity (Malyuga, 2019).

A third line of development integrates CBI with genre-based pedagogy. Genre research shows that disciplinary communities routinise purposes, rhetorical moves, and lexical-grammatical resources. Teaching these explicitly supports participation in knowledge-making practices rather than generic ‘skills’ (Hyland, 2007; Deveci, 2025). In ESP, genre-based CBI links reading and writing of target genres to the social actions they perform (e.g., reviewing literature to position claims, reporting methods to warrant inference), thereby furnishing principled criteria for selecting texts, sequencing tasks, and engineering feedback (Airey, 2016). This integration addresses a recurrent weakness of content-only models: under-specification of language form/function at points where genre conventions do the heaviest epistemic work.

Methodologically, ESP-CBI design depends on needs analysis that is validated against target-situation performance (Bocanegra-Valle, 2016). The canonical volume on needs analysis codifies triangulation across genre audits, observations, and performance sampling (Long, 2005). Later work extends this to programme-level evaluation linking needs analysis to outcomes. In practical terms, this means deriving curricular targets from what learners must do (e.g., read method sections to extract design decisions, deliver ethics-compliant briefings), not from what syllabi traditionally include (Smith et al., 2022).

Nevertheless, integrating content and language introduces design tensions that matter acutely in the social sciences, where knowledge is less procedurally standardised than in technical fields. Four recurrent challenges surface in the literature. First, focus balance: without principled focus on form, language development can plateau, yet excessive form-focus may distort content aims. The ‘counterbalanced instruction’ model addresses this by sequencing cycles of comprehension, awareness, and production that systematically push attention to language as it mediates content learning (Cammarata et al., 2016). Second, cognitive load: dense conceptual content, specialised terminology, and unfamiliar genre conventions can overload working memory unless tasks are staged and redundancy reduced (Sweller, 2020; Grishechko & Tomalin, 2025; Druzhinin, 2025). Third, assessment alignment: if assessments reward content recall more than discourse performance, learners (and teachers) rationally deprioritise language learning. Programme evaluation studies argue for dual-criterion rubrics anchored in target-genre moves (Richards & Pun, 2023). Fourth, teacher knowledge and collaboration: ESP teachers often report gaps in disciplinary knowledge, while subject specialists report uncertainty about language objectives. Recent reviews recommend structured collaboration models and teacher education that explicitly builds genre and discourse expertise (Supunya, 2023).

In sum, contemporary research portrays CBI as a powerful but designed intervention in ESP, not a mere choice of materials. A defensible ESP-CBI course makes its language outcomes explicit, derives tasks from target-situation genres, attends to focus-on-form through counterbalanced cycles, manages cognitive load through principled scaffolding, aligns assessment with dual aims, and organises teacher collaboration around shared genre knowledge. These positions consolidate advances in ESP (disciplinary literacy and genre), integrate evidence from integrated-content programmes (effect sizes and boundary conditions), and answer longstanding critiques about authenticity and form-content balance. This furnishes a theoretically coherent and empirically grounded basis for ESP curriculum development in discipline-specific contexts.

2.2. Previous approaches in ESP across disciplines

Research across multiple professions shows that ESP grounded in CBI is most effective when course design is driven by the genres, tasks, and epistemic norms of each field rather than by generic language objectives. What follows synthesises approaches from medicine and nursing, business and management, engineering and other STEM domains, law, aviation and maritime sectors, tourism/hospitality, and computing/data science, drawing out design principles, known pitfalls, and credible transfer points to psychology.

Medical ESP has long paired authentic documentation (case reports, clinical guidelines, research articles) with genre-explicit teaching, but the last decade’s rapid uptake of simulation has materially changed what ‘authenticity’ looks like pedagogically. Large-scale reviews in health professions education indicate that

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simulation improves clinical performance and patient safety outcomes, which in ESP terms translates into content-anchored speaking, listening, and note-taking under time pressure and ethical constraints (Elendu et al., 2024). These contexts force explicit attention to stance, mitigation, and risk communication, which are language features that are central to clinical reasoning. Recent work also examines the identities of clinicians who serve as ESP facilitators in simulation programmes and show the need to balance disciplinary fidelity with deliberate language focus (Walker et al., 2025). These studies point out that ‘authenticity’ is best operationalised as realistic roles, artifacts, and consequences, and not just unedited texts.

Business-oriented ESP has shifted from ‘terminology + formats’ to communicative competence in English as a Business Lingua Franca (BELF). Ethnographically informed studies demonstrate how effective professionals manage clarity and rapport across lingua-franca interactions in email, meetings, negotiations, and cross-border projects (Roshid et al., 2022). The pedagogical upshot is tasks that assess intelligibility, audience design, and relational work rather than ‘native-like’ phrasing. This stance also reframes assessment: performance rubrics reward success in negotiation, conflict mitigation, and deliverable-oriented documentation (Klimova & Pikhart, 2021). The BELF literature thereby legitimises outcome measures that psychology-focused ESP can adapt (e.g., briefing memos to non-experts, case-conference talk).

In engineering, ESP often couples project-based learning with explicit genre instruction for lab reports, design justifications, and poster/pitch communication. Empirical needs analyses and genre audits show recurrent move structures around problem definition, design constraints, and method selection. These are the features that make engineering a fertile testbed for integrated content–language assessment (Hsu et al., 2025). Programme evaluations in STEM also stress multimodality: students must orchestrate prose, schematics, equations, and visuals, prompting ESP to assess cross-modal cohesion rather than sentences in isolation (Grishechko, 2024). These orientations (task derivation from target genres and multimodal assessment) map cleanly to psychology’s research poster sessions, method write-ups, and ethics applications (Zafarghandi et al., 2017).

Legal English ESP leverages genre analysis to make the rhetorical work of legal texts teachable: establishing jurisdiction and standing, stating claims and defences, citing authority, and crafting remedies. Recent studies on research-article abstracts and litigation documents show that explicit move-structure teaching improves learners’ control over stance, evidentiality, and audience expectations in highly codified settings (Nguyen, 2024). Because legal discourse is adversarial, instruction highlights precision, hedging calibrated to risk, and intertextuality, which are priority foci that resonate with psychology’s needs in ethics statements, informed-consent texts, and case notes where liability and confidentiality matter.

Aviation English research differentiates between ICAO phraseology (formulaic radiotelephony) and ‘plain English’ for non-routine events. Both must be taught and assessed because safety-critical communication breaks down precisely at the boundary between scripted and unexpected (Drayton & Coxhead, 2023). Parallel developments in Maritime English foreground standardised message patterns (e.g., SMCP) and routine ship-to-ship/ship-to-shore discourse, with curricula increasingly built on syllabus audits and teacher interviews to ensure domain-faithful language targets (Zhang & Cole, 2018). Pedagogically, these show the value of (i) controlled phraseology for predictable moves and (ii) scenario-based tasks for emergent problem-solving. This is a duality psychology can emulate in, for example, standardised patient interviews and unstructured counselling talk.

Tourism ESP programmes now incorporate digital-literacy outcomes alongside language aims, acknowledging that frontline communication is mediated by booking systems, review platforms, and multimodal marketing assets. Design-based research in this area aligns task cycles with authentic digital artifacts (service recovery responses, multi-channel itineraries), arguing for assessment that weights user-experience clarity and intercultural appropriateness (Chang, 2024). The relevance for psychology is straightforward: many subfields (e.g., health psychology, organisational psychology) require public-facing, plain-language communication – often in digital environments with lay audiences.

Studies of computing students’ ESP needs identify gaps in technical writing (requirements documentation, API notes, reproducible methods) and in research-genre literacy, even when general English proficiency is adequate (Wahyuni & Darmansyah, 2021). The most successful interventions pair genre models with authentic repositories, code comments, and issue-tracker discourse, treating readability, traceability, and reproducibility as language-mediated quality criteria (Balaei & Ahour, 2018; Kuznetsova & Petrulovich, 2018). For psychology (where preregistrations, method sections, and data-availability statements are increasingly normative) this alignment of language with transparency and replication is instructive.

Across these disciplines, effective ESP-CBI is neither ‘language through osmosis’ nor ‘content with glosses’. It is designed instruction that (i) models the social actions of target genres, (ii)

builds scenario fidelity and consequences into tasks, (iii) calibrates cognitive load and multimodal demands, and (iv) secures alignment among teaching, assessment, and professional performance. These design commitments – evidenced in safety-critical domains (aviation, maritime, medicine), compliance-driven fields (law), outcome-oriented business settings, and multimodal STEM practice – constitute a credible foundation for psychology-specific ESP where students must alternate between interpretive academic discourse and ethically sensitive interpersonal communication.

Thus, the cross-disciplinary literature reveals several consistent lessons. First, the integration of authentic materials is indispensable for developing discipline-specific communicative competence. Second, collaboration between subject specialists and language instructors enhances the effectiveness of curriculum design. Third, the balance between content and language requires careful calibration: too strong a focus on disciplinary content risks overwhelming learners linguistically, while an overly narrow focus on language may fail to prepare them for professional practice. These lessons provide a conceptual foundation for extending CBI into other academic and professional fields, including psychology.

2.3. The gap in ESP for psychology majors

Although ESP and CBI have matured across many professional fields, psychology remains comparatively under-mapped as a distinct ESP domain. In the past few years, several small-scale evaluations and needs analyses focused on psychology cohorts have appeared. These were useful for surfacing perceived needs, but limited by modest samples, single-course perspectives, and a predominant reliance on student self-report rather than performance data or genre audits (Setyowati et al., 2023; Syaufika & Ambarwati, 2023; Ananta et al., 2025; Gorina et al., 2025). This uneven evidence base contrasts with the rich, genre-explicit ESP literatures in medicine, engineering, and law, and it constrains our ability to generalise about design principles suited specifically to psychology.

The communicative profile of psychology justifies more targeted inquiry. Undergraduate and pre-professional learning outcomes endorsed by the American Psychological Association (APA) explicitly include scientific reasoning, research design, ethical communication, and discipline-appropriate writing – outcomes that exceed generic academic English and call for instruction anchored in psychology's genres and reporting practices (APA, 2016). Moreover, the APA's Journal Article Reporting Standards (JARS) formalise the rhetorical load of method, results, and transparency statements, shaping the 'moves' writers must accomplish when communicating quantitative, qualitative, and mixed-methods studies. An ESP curriculum that ignores JARS risks teaching decontextualised prose rather than the regulated discourse psychologists actually produce (APA, 2025). Recent genre-focused analyses underscore the point: studies of psychology articles document cross-linguistic and proficiency-linked differences in move structure and stance (e.g.,

method sections, conclusions), reinforcing the need for discipline-specific language work rather than generic templates (Moradi & Montazeri, 2024; Deng & He, 2023).

Professional preparation in psychology further complicates the picture in ways that generic EAP cannot easily address. Beyond research writing, many pathways (clinical, health, school, organisational) require ethically sensitive, client-facing communication. Assessment and training ecologies in allied areas (psychiatry and clinical psychology practicums) now routinely use standardised/simulated patient encounters and objective structured clinical examinations (OSCEs) to develop and evaluate interviewing, empathy, and risk communication. These approaches have begun to appear within psychology programmes themselves, but they remain largely decoupled from language-focused curricula, leaving a design opportunity for ESP to integrate genre, interactional competence, and assessment (Siemerkus et al., 2023; Sundström & Hakelind, 2023; Sundström et al., 2024). The simulation literature consistently shows gains in communication performance (Elendu et al., 2024). Importing its task design and feedback architectures into ESP for psychology would permit dual-focus assessment on both disciplinary adequacy and linguistic effectiveness.

Where psychology-focused ESP courses exist, materials frequently hew to general academic skills (reading for gist, essay composition, slide presentations) with only sporadic alignment to psychology's genres (e.g., method write-ups, case notes, IRB/ethics applications, plain-language summaries for lay readers) (Akopova, 2016a; Akopova, 2016b). Textbook evaluations and course audits repeatedly note overreliance on decontextualised texts and vocabulary lists, limited engagement with authentic artifacts (consent forms, diagnostic rubrics, preregistration templates), and a lack of validated rubrics tied to disciplinary communicative outcomes. Parallel developments in psychology's dissemination practices heighten the gap: journals and societies increasingly encourage or require plain-language summaries, which entail different stance, audience design, and multimodal demands than research abstracts, yet these deliverables are rarely targeted in ESP syllabi (Setyowati et al., 2023).

Structural factors also work against coherent psychology-ESP development. Reviews of collaboration between language specialists and subject lecturers point out collaboration as a determinant of quality but document persistent institutional and knowledge barriers (e.g., uncertain ownership of outcomes, misaligned assessment regimes, limited teacher access to discipline expertise). These challenges are well described in ESP/EAP generally and remain salient for psychology, where content expertise is distributed across diverse subfields and practicum settings (Li, 2021; Supunya, 2023). In parallel, the growth of English-medium instruction (EMI) across non-Anglophone universities places additional pressure on programmes, including psychology, to couple content mastery with language support, yet EMI studies repeatedly report variability in language focus and teacher preparedness, underscoring the need for formalised, language-aware curriculum models (Varis, 2024; Han, 2023).

Taken together, at least four design needs emerge that current psychology-ESP offerings seldom meet: (i) genre-anchored curricula aligned with APA reporting conventions and psychology's evaluative genres (posters, method write-ups, ethics/consent texts); (ii) task authenticity that reflects real roles and consequences in research and client-facing communication (e.g., standardised-patient interviews, case-conference briefings); (iii) assessment aligned to dual aims, using rubrics that capture disciplinary adequacy and language control rather than sentence-level accuracy alone; and (iv) structured co-teaching/PD models that develop shared genre knowledge between psychology faculty and ESP practitioners. The scattered but converging evidence above specifies the gap not as a mere absence of materials, but as a need for validated, content-integrated designs and assessments tuned to psychology's communicative ecology. A systematic application of CBI to psychology, grounded in needs analysis, genre audits, simulation-supported tasks, and co-designed assessment, would therefore address an identifiable deficit in the ESP literature and practice, with clear payoffs for academic success and professional readiness.

3. MATERIAL AND METHODS

3.1. Research design

The study used text/genre analysis of psychology-specific materials in combination with a curriculum audit of an existing ESP syllabus for psychology majors. This design was chosen because it enables a systematic examination of the discourse demands embedded in psychology as a discipline and allows for a comparison between these demands and the current provision of English language instruction. In this way, the study directly addresses the stated purpose: to evaluate the potential of content-based instruction (CBI) as a framework for integrating language learning with disciplinary content, while also identifying obstacles in curriculum implementation.

3.2. Material

Two sets of material were examined:

1. Psychology-specific texts ($n = 50$) included research articles, case reports, ethical documents and instructional artifacts

Research articles ($n = 12$): method and discussion sections selected from peer-reviewed journals in clinical, cognitive, and educational psychology. These sections were prioritised because they operationalise the APA Journal Article Reporting Standards and represent genres students must both comprehend and eventually produce.

Case reports ($n = 11$): anonymised samples drawn from clinical training materials, as they illustrate professional diagnostic reasoning and narrative construction.

Ethical documents ($n = 15$): informed-consent forms and institutional review board templates, chosen for their role in instantiating ethically sensitive/legally binding communication.

Instructional artifacts ($n = 12$): psychology research poster templates and presentation guidelines, reflecting multimodal requirements of professional dissemination.

These texts cover academic, professional, and public-facing genres essential to psychology and were selected to provide a balanced view of the discipline's communicative ecology.

2. ESP curriculum documents ($n = 2$) included one current ESP syllabus for psychology majors and one corresponding course textbook currently used at a partner institution. These were chosen because they represent the baseline of existing practice against which the findings from genre analysis can be compared.

3.3. Procedure

The study proceeded in two interconnected stages. First, the psychology-specific texts were subjected to analysis within a genre-based discourse framework (Swales, 1990; Hyland, 2007). Particular attention was devoted to the identification of rhetorical moves, such as problem framing, methodological justification, ethical stance-taking, and result interpretation, as well as to the recurrent use of lexical bundles and terminology clusters characteristic of psychology discourse. The analysis also examined stance and hedging devices in empirical research writing, interactional features embedded in case reports and consent forms, and the ways in which multimodal cohesion was achieved in research posters. This investigation combined qualitative coding of rhetorical moves with a basic quantitative representation of recurring linguistic features, for example the frequency of reporting verbs or stance markers. The integration of qualitative and quantitative approaches reflects established practices in applied linguistics and makes it possible to capture both the structural and the functional aspects of disciplinary discourse.

The second stage involved a curriculum audit that drew on the analysis of an ESP syllabus and its accompanying textbook. The aim was to determine how closely the existing curriculum corresponded to the discourse demands revealed in the first stage of the study. This was accomplished by tracing the extent to which psychology-specific genres were represented, the degree to which authentic disciplinary materials were incorporated, and the alignment of stated learning outcomes with the communicative practices of the discipline. Attention was also paid to the balance between general academic English skills and domain-specific competencies. Through this comparative exercise, the curriculum audit provided a diagnostic perspective on whether current ESP provision adequately reflects the communicative requirements that emerge from psychology discourse.

3.4. Data analysis

Findings from the genre analysis were tabulated according to genre type, rhetorical move structure, and lexical-grammatical features. These were then compared against the ESP syllabus to identify areas of convergence (e.g., shared emphasis on academic writing skills) and divergence (e.g., neglect of ethical documents or multimodal communication tasks). The analysis thus generated both a descriptive map of psychology's discourse demands and a diagnostic account of gaps in current ESP provision.

‘Thus, the cross-disciplinary literature reveals several consistent lessons. First, the integration of authentic materials is indispensable for developing discipline-specific communicative competence. Second, collaboration between subject specialists and language instructors enhances the effectiveness of curriculum design. Third, the balance between content and language requires careful calibration: too strong a focus on disciplinary content risks overwhelming learners linguistically, while an overly narrow focus on language may fail to prepare them for professional practice. These lessons provide a conceptual foundation for extending CBI into other academic and professional fields, including psychology’

3.5. Methodological justification

The choice of materials reflects the dual nature of psychology as an academic and professional discipline: research articles represent the scientific facet, case reports and consent forms embody the clinical and ethical facet, while research posters illustrate the multimodal dissemination practices increasingly required in professional psychology. The study situates itself within the scientific tradition of ESP research, which relies on empirical discourse analysis and systematic needs assessment to inform curriculum design (Long, 2005; Bocanegra-Valle, 2016). The methodology is modest in scale yet robust enough to evaluate whether CBI can provide a systematic framework for curriculum development and to pinpoint obstacles in its implementation.

4. STUDY RESULTS

4.1. Overview of the corpus

The analysis was conducted on a purposively constructed corpus of fifty psychology-specific texts supplemented by two ESP curriculum documents currently used for psychology majors. The corpus was designed to reflect the communicative diversity of psychology as both an academic discipline and a professional field. It encompassed four distinct text types: research articles, case reports, ethical documents, and instructional artifacts. Together these genres capture the range of discourse practices psychology students are expected to master at different stages of their academic and professional training.

The first category, research articles, comprised twelve texts drawn from peer-reviewed journals in clinical, cognitive, and educational psychology. Only the method and discussion sections were included, since these are the sections most directly regulated by the American Psychological Association’s Journal Article Reporting Standards and therefore provide consistent evidence of rhetorical structuring and disciplinary conventions. The inclusion of articles across three subfields ensured representativeness of disciplinary variation.

The second category, case reports, consisted of eleven anonymised samples taken from clinical training materials. Case reports were selected because they exemplify diagnostic reasoning and narrative construction, which are central communicative practices in psychology yet distinct from the more formulaic style of empirical reporting. Their inclusion allows for comparison between highly structured research genres and more descriptive, interpretive forms of professional writing.

The third category, ethical documents, included fifteen texts such as informed-consent forms and institutional review board (IRB) templates. These were chosen because they instantiate the ethically sensitive and legally binding forms of communication that psychology professionals must produce. Unlike research articles or case reports, ethical documents rely heavily on formulaic language and prescriptive phrasing and thus capture another facet of psychology’s communicative ecology.

The fourth category, instructional artifacts, consisted of 12 research poster templates and presentation guidelines used in undergraduate and postgraduate psychology programmes. These texts were selected for their relevance to multimodal communication and professional dissemination practices. Unlike the other genres, they combine visual and textual modes, requiring students to integrate data display, concise textual explanation, and persuasive framing in a single communicative event.

Alongside the disciplinary corpus, the study examined two ESP curriculum documents, namely one syllabus and one accompanying textbook in current use at a partner institution. These documents were included to provide a baseline of existing pedagogical practice against which the disciplinary demands identified in the corpus could be compared.

In terms of distribution, the corpus shows a balanced representation across academic, clinical, ethical, and multimodal material, with research articles accounting for 24% of the material, case reports for 22%, ethical documents for 30%, and instructional artifacts for 24%. This proportional spread was intentional, designed to avoid overrepresentation of traditional academic writing and to showcase the wider set of genres that psychology students encounter. The overall size of the corpus ($n = 50$) is modest yet sufficient for qualitative and frequency-based analysis, and it reflects established practice in ESP studies that rely on carefully curated rather than large-scale corpora.

This composition gives an overview of the communicative ecology of psychology. The corpus allows for the mapping of the rhetorical, lexical, and multimodal demands placed on learners. It also ensures that the subsequent curriculum audit can be assessed against a representative range of disciplinary practices.

4.2. Genre and discourse features in psychology texts

The analysis of the psychology-specific texts revealed current genre- and discourse-level features that reflect the communicative practices of the discipline. Each text type demonstrated distinctive patterns of rhetorical organisation, lexical usage, and discourse strategies, yet several commonalities could also be observed across genres.

'Professional preparation in psychology further complicates the picture in ways that generic EAP cannot easily address. Beyond research writing, many pathways (clinical, health, school, organisational) require ethically sensitive, client-facing communication. Assessment and training ecologies in allied areas (psychiatry and clinical psychology practicums) now routinely use standardised/simulated patient encounters and objective structured clinical examinations (OSCEs) to develop and evaluate interviewing, empathy, and risk communication. These approaches have begun to appear within psychology programmes themselves, but they remain largely decoupled from language-focused curricula, leaving a design opportunity for ESP to integrate genre, interactional competence, and assessment'

Research articles displayed a high degree of rhetorical structuring, particularly in the method and discussion sections. The method sections consistently followed predictable move patterns, beginning with statements of participant characteristics and proceeding to descriptions of materials, procedures, and data analysis. These moves were often signalled by recurrent lexical bundles such as *participants were recruited*, *data were analysed using*, and *the procedure consisted of*. Discussion sections, by contrast, showed more variation but typically included interpretive commentary on findings, references to previous studies, and evaluative statements regarding limitations. Stance and hedging devices were prominent, with frequent use of modals (*may suggest*, *could indicate*) and epistemic markers (*likely*, *possibly*) to temper claims. Counts of lexical items indicated a marked prevalence of reporting verbs, most notably *show*, *demonstrate*, and *reveal*, which bring to the fore the discipline's reliance on empirical evidence to frame claims.

Case reports revealed a markedly different discourse profile. Unlike the formulaic structure of research articles, these texts had a narrative organisation, often beginning with a description of the patient's background, followed by a chronological account of presenting problems, diagnostic assessments, and therapeutic interventions. Lexical choices reflected this narrative orientation, with verbs of description and observation (*appeared*, *reported*, *described*) occurring frequently. Interactional features were also more salient in this genre: first-person pronouns, references to dialogue, and evaluative adjectives exposed the interpersonal aspect of clinical reasoning. Compared with research articles, case reports demonstrated less reliance on hedging and greater use of definitive diagnostic language, which reflected the need to convey authority in professional contexts.

Ethical documents (informed-consent forms and IRB templates) were characterised by formulaic and prescriptive discourse. These texts consistently relied on fixed expressions such

as *you are invited to participate*, *your participation is voluntary*, and *confidentiality will be maintained*. The analysis showed a predominance of deontic modality (*must*, *will*, *should*), signalling obligation and assurance. The lexical density of these texts was lower than in research articles. This has to do with an intentional effort to enhance accessibility, yet syntactic structures were nonetheless complex due to embedded conditions and qualifications. The repetitive use of phrases related to risk, confidentiality, and rights signalled the regulatory function of these documents.

Instructional artifacts such as poster templates and presentation guidelines demonstrated the multimodal requirements of disciplinary communication. These texts placed strong emphasis on brevity, clarity, and visual integration. Frequent directives (*summarise the results*, *use bullet points*, *include visuals*) conveyed the instructional purpose of the genre. The language was prescriptive and process-oriented, and multimodal cohesion was explicitly foregrounded through instructions on layout, figure captions, and design conventions. Lexical items emphasising conciseness (*brief*, *clear*, *concise*) were recurrent, which indicated the communicative value attached to economy of expression in poster and presentation formats.

Across all four genres, several cross-cutting discourse features were observed. First, the frequent use of stance markers and hedging in research articles contrasted with the more definitive tone of case reports and the prescriptive modality of ethical documents. Second, the reliance on formulaic expressions was most pronounced in ethical texts but also appeared in instructional artifacts. This suggests that certain communicative functions in psychology are supported by fixed linguistic templates. Third, multimodality emerged as an important element not only in research posters but also in the integration of tables and figures within research articles. This signalled that visual-verbal coordination is a recurrent demand across psychology discourse.

The combined analysis demonstrates that psychology discourse encompasses an array of communicative practices that ranges from empirically grounded, hedged argumentation in research writing to narrative reasoning in case reports, formulaic and legally binding phrasing in ethical documents, and multimodal summarisation in instructional artifacts. Each genre imposes specific linguistic and rhetorical requirements, and together they delineate the communicative environment within which psychology majors are expected to operate.

4.3. Cross-genre patterns

The comparative examination of genres revealed several broader tendencies that traverse psychology discourse and shape its communicative environment. These patterns were not tied to individual genres alone but emerged through contrasts and overlaps across the corpus.

A first pattern concerned the distribution of certainty and authority. Research articles leaned heavily on hedging and epistemic markers to signal caution in knowledge claims, while case reports conveyed diagnostic authority through categorical

phrasing. Ethical documents, in turn, relied on prescriptive modality to establish compliance, whereas instructional artifacts adopted imperative forms to direct student action. Viewed together, these variations reveal a spectrum of stance-taking practices across psychology, ranging from the tentative presentation of empirical findings to the unequivocal assertion of ethical obligations.

A second pattern involved the tension between standardisation and individuality. Highly conventionalised structures dominated research articles and ethical documents, where adherence to APA guidelines or legal formulations dictated textual form. Case reports, by contrast, incorporated greater narrative flexibility and personalised detail, reflecting the individuality of patient cases. Instructional artifacts, as observed, occupied an intermediate position, codifying format while allowing some latitude in visual design. This variation shows how psychology discourse balances institutionalised conventions with context-sensitive narration.

A third pattern related to the integration of multimodality into disciplinary communication. While poster templates and presentation guidelines explicitly foregrounded the combination of text and visuals, other genres (particularly research articles and consent documents) also incorporated visual elements such as tables, diagrams, and structured layouts. The need to navigate both textual and visual semiotic resources thus appears not as an isolated requirement but as a consistent feature across the discipline.

Finally, the analysis identified the recurrence of discipline-specific lexical repertoires. Each genre foregrounded distinct clusters (empirical reporting verbs in research articles, diagnostic descriptors in case reports, rights and obligations in ethical texts, and conciseness-related terms in instructional artifacts) yet these clusters collectively reinforced psychology's epistemic and professional priorities. Despite genre-specific differences, the reliance on specialised vocabulary served to anchor communication in the discipline's conceptual framework.

These cross-genre patterns demonstrate that psychology's communicative practices cannot be understood in isolation. Instead, they operate within a system of contrasts and complementarities, where stance, structure, modality, multimodality, and lexis function differently depending on the genre but collectively define the expectations placed on psychology students and professionals.

4.4. ESP curriculum content

The examination of the ESP syllabus and textbook currently used for psychology majors revealed a curriculum that remains predominantly oriented toward general academic English rather than discipline-specific discourse. The syllabus, structured around thematic units such as Academic Writing, Oral Presentations, and Reading Academic Texts, set out learning outcomes that emphasised broad academic skills, including note-taking, essay composition, summarising, and delivering formal talks. While these objectives correspond to common practices in

English for Academic Purposes, they showed limited explicit engagement with the genres and communicative tasks identified in the psychology corpus.

The textbook accompanying the syllabus mirrored this orientation. The majority of reading passages consisted of general academic or semi-specialised texts, often adapted for pedagogical purposes rather than drawn from authentic disciplinary sources. Exercises prioritised comprehension questions, vocabulary extension, and grammar-focused tasks. Writing assignments were generally framed in terms of producing argumentative essays, reports, or short presentations, with little attention to discipline-specific genres such as empirical research articles, case reports, or ethical documentation. The presence of psychology-related content was mostly confined to short thematic texts on topics such as memory, motivation, or social behaviour, which served as vehicles for language practice but were not analysed as disciplinary discourse.

An audit of the genre coverage indicated that research articles, the central genre in academic psychology, were not represented as authentic exemplars. Students were not systematically exposed to the rhetorical moves of empirical writing, nor were they guided through the conventions of method or discussion sections. Similarly, case reports, which represent a core communicative practice in clinical training, were entirely absent from the syllabus. Ethical documents, such as consent forms or IRB applications, were likewise not included, despite their importance for professional practice. The only partial overlap with disciplinary practice was found in tasks involving poster presentations, which resembled the multimodal communication required in psychology but were framed at a general academic level without reference to APA norms or disciplinary expectations.

In terms of materials design, the textbook and syllabus relied heavily on simplified or adapted input. Authenticity was compromised through the use of modified texts that reduced lexical and syntactic complexity. While such adaptations served to scaffold comprehension, they also limited opportunities for students to encounter the formulaic expressions, stance markers, and multimodal integration characteristic of psychology discourse. The emphasis on generic academic vocabulary lists further reinforced this orientation, with limited systematic attention given to psychology-specific terminology or recurring lexical bundles.

Finally, the balance of skills within the curriculum leaned toward receptive comprehension and general-purpose writing. Speaking activities centred on giving short presentations or participating in seminar-style discussions, without any role-play or simulation of counselling dialogues, case conferences, or research group meetings. Listening tasks were restricted to short academic lectures rather than disciplinary interactions. This configuration provided students with transferable skills but did not align with the communicative ecology documented in the psychology corpus, where disciplinary literacy extends beyond essay writing to include ethical communication, diagnostic narration, and multimodal dissemination.

Taken as a whole, the ESP curriculum presented a structured but generalist approach to academic English. It provided coverage of core study skills but offered little systematic exposure to psychology-specific genres, discursive practices, or professional communicative tasks. This empirical mapping therefore establishes the baseline against which the corpus findings can be compared, allowing subsequent analysis to identify points of convergence and divergence between existing ESP provision and the disciplinary discourse demands of psychology.

4.5. Corpus findings vs ESP curriculum

To assess the extent of alignment between psychology discourse and current ESP provision, the results of the corpus analysis were directly mapped against the content of the syllabus

and textbook. Table 1 summarises the comparison. The table shows that the curriculum intersects with psychology discourse only at a general academic level.

Areas of partial overlap were identified in academic writing and poster presentations, but, as the study has observed, without reference to the rhetorical and lexical conventions found in authentic psychology texts. Substantial divergence was observed in relation to case reports and ethical documentation, both of which were central to the disciplinary corpus yet absent from the curriculum.

Following study results, Lexical and skills coverage also proved misaligned: psychology-specific clusters and multimodal demands present in the corpus were not reflected in the textbook or syllabus.

Table 1
Alignment of psychology discourse features with ESP curriculum

GENRE / FEATURE	CORPUS EVIDENCE (TEXTS ANALYSED)	ESP CURRICULUM COVERAGE	ALIGNMENT STATUS
Research articles	12 texts; structured methods and discussions; frequent reporting verbs; hedging and stance markers	Simplified academic texts; essay/report writing tasks; no authentic articles	Partial, generic only
Case reports	11 texts; narrative structuring; diagnostic lexis; interpersonal features	Absent from syllabus and textbook	None
Ethical documents	15 texts; formulaic language; deontic modality; risk/confidentiality lexis	Absent from syllabus and textbook	None
Instructional artifacts (posters)	12 texts; multimodal cohesion; directives on concision and visuals	Poster presentations included but treated generically, no APA conventions	Partial, limited
Lexical bundles	Discipline-specific clusters (reporting verbs, diagnostic terms, deontic	General academic vocabulary lists, not discipline-specific	Limited
Skills balance	Reading, writing, speaking, multimodal integration across genres	Reading and writing emphasised; minimal oral/multimodal practice	Narrow focus

5. DISCUSSION

5.1. The potential of CBI for psychology

The purpose of this study was to establish the potential of CBI as a framework for integrating language learning with disciplinary content in psychology and to identify obstacles in curriculum design and implementation. The study has generated empirical evidence of both convergences and divergences between disciplinary practices and current instructional provision.

The corpus analysis demonstrated that psychology operates through a diverse communicative ecology encompassing research articles, case reports, ethical documents, and multimodal instructional artifacts. Each genre embodies distinctive rhetorical structures and linguistic resources that align with the epistemological and professional priorities of the discipline: empirical caution in research writing, authoritative diagnostic narration in

case reports, prescriptive modality in ethical texts, and conciseness combined with visual integration in posters. These findings confirm that psychology discourse extends beyond general academic English and requires mastery of discipline-specific genres.

CBI, as established in ESP literature (Snow & Brinton, 2023; Hyland, 2007; Kolmogorova et al., 2024; Slivnaya et al., 2023; Samofalova et al., 2023), is designed precisely to bridge this gap by embedding authentic disciplinary content into language instruction. In the case of psychology, a CBI approach would allow learners to engage directly with the genres they must eventually produce and interpret, while simultaneously acquiring the linguistic resources necessary to participate in disciplinary communication. The potential of CBI therefore lies in its ability to align instructional content with the actual communicative practices of psychology, reducing the disconnect between language study and professional preparation.

'The comparison between the corpus findings and the ESP curriculum revealed significant limitations in current provision. While the syllabus included some generic academic genres, such as essays and poster presentations, these were presented at a generalist level, with little attention to disciplinary conventions. The most striking gap was the complete absence of case reports and ethical documents, which together accounted for over half of the disciplinary texts analysed. Even research articles, which are central to academic psychology, were represented only through simplified or adapted versions. This stripped them of the rhetorical and lexical complexity that learners must eventually deal with'

5.2. Obstacles in current curriculum design

The comparison between the corpus findings and the ESP curriculum revealed significant limitations in current provision. While the syllabus included some generic academic genres, such as essays and poster presentations, these were presented at a generalist level, with little attention to disciplinary conventions. The most striking gap was the complete absence of case reports and ethical documents, which together accounted for over half of the disciplinary texts analysed. Even research articles, which are central to academic psychology, were represented only through simplified or adapted versions. This stripped them of the rhetorical and lexical complexity that learners must eventually deal with.

These findings mirror challenges identified in other ESP contexts. Research in medical and legal English has consistently shown that generic academic tasks provide insufficient preparation for professional communication, as they neglect the rhetorical demands and formulaic language of specialised genres (Candlin & Candlin, 2003; Ferguson, 2025). Similar observations have been made in engineering, where project-based genres and multimodal integration are often underrepresented in ESP curricula (Hsu et al., 2025). The psychology case illustrates the same structural problem: curricula tend to prioritise transferable skills at the expense of discipline-specific practices, creating a mismatch between instruction and communicative reality.

5.3. Implications for CBI implementation

The findings point to several implications for how CBI could be applied to psychology. First, curriculum design should expand the range of genres used in instruction, moving beyond essays and presentations to include case reports, ethical documents, and authentic research articles. This does not imply abandoning general academic skills, but rather incorporating them within disciplinary contexts, for example by teaching summarisation or argumentation through the medium of psychology texts.

Second, the analysis exposes the need to address multimodality explicitly. Psychology communication, whether in research articles with figures and tables or in posters with integrated visuals, requires competence in coordinating textual and visual modes. CBI provides a natural framework for addressing this integration, as it situates language learning in authentic multimodal tasks.

Third, lexical coverage in the curriculum needs to shift from general academic lists to systematic treatment of psychology-specific clusters and formulaic sequences. Evidence from discourse-analytic studies shows that recurrent lexical patterns play a significant role in shaping disciplinary communication, and their pragmatic value becomes visible through co-occurrence analysis (Malyuga & Rimmer, 2021). CBI's emphasis on authentic input offers an effective mechanism for exposing learners to such patterns and for developing their productive use in writing and speech.

Finally, implementation of CBI in psychology will require collaboration between language instructors and disciplinary specialists. As noted in other fields (Basturkmen, 2010; Bocanegra-Valle, 2016), successful integration depends on co-design, where subject specialists ensure content fidelity and language instructors focus on scaffolding linguistic access. Without such collaboration, curricula risk either oversimplifying disciplinary content or overburdening learners with unmediated texts.

5.4. Limitations and directions for further research

The present study has limitations that should be acknowledged. The corpus, while diverse, was modest in size and restricted to a small set of representative genres. The curriculum audit was based on a single syllabus and textbook, which may not capture variation across institutions. Future research should broaden the scope to include multiple programmes, larger corpora, and longitudinal observation of how psychology students engage with CBI-based materials in practice. Classroom-based interventions and student performance data would further substantiate the effectiveness of proposed curricular reforms.

6. CONCLUSION

This study investigated the potential of content-based instruction (CBI) to provide a systematic framework for integrating language learning with disciplinary content in psychology and to identify obstacles in curriculum design and implementation. Through text and genre analysis of psychology-specific materials and a comparative audit of an existing ESP syllabus and textbook, the study has mapped the communicative practices central to psychology and assessed the extent to which these are represented in current instructional provision.

The results demonstrated that psychology discourse is organised around a range of genres (research articles, case reports, ethical documents, and multimodal instructional artifacts) each requiring distinctive rhetorical, lexical, and multimodal competences. However, the ESP curriculum analysed showed only partial alignment with these practices, concentrating on general

academic English skills while omitting the discipline-specific genres most critical to professional preparation. The divergence was particularly evident in the absence of case reports and ethical documentation, as well as the reliance on simplified rather than authentic research articles.

These findings point to the relevance of CBI as a pedagogical framework capable of bridging the gap between generalist instruction and disciplinary communication. Integrating authentic psychology materials into instruction, broadening genre coverage, and systematically incorporating multimodal and discipline-specific lexical practices positions CBI as a means of fostering both language proficiency and professional preparedness. While the study provides one of the first systematic mappings of psy-

chology discourse in relation to ESP curriculum design, it is limited by the modest size of its corpus and the focus on a single syllabus and textbook. Future research should broaden the empirical base through larger and more varied corpora, multi-institutional curriculum audits, and classroom-based interventions that test the effectiveness of CBI in practice.

The study contributes to applied linguistics and ESP pedagogy as it demonstrates that psychology represents a distinct and underexplored disciplinary context in which CBI holds considerable promise. Addressing the identified curricular gaps will strengthen language instruction for psychology majors and advance the agenda of aligning ESP with the authentic communicative practices of diverse academic and professional fields.

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Original Research

Cognitive processing of educational polycode text: An experimental eye-tracking study

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This study investigates the cognitive processing of educational PCTs by Russian-speaking readers, addressing the research gap concerning how this process is executed, regulated, and influenced by various factors. The primary aim is to explore the principles of text-image integration during the reading of an educational PCT by native Russian-speaking readers. Employing the concept that eye movements correspond to the logic of cognitive processing, the study uses eye-tracking methods to analyse this process. It relies on eye-movement data from 67 Russian students in the socio-humanities who read an educational polycode biology text in Russian. Findings reveal that the verbal component plays a dominant role in the cognitive processing of this text type, suggesting that this dominance is not dependent on the national educational culture. At the same time, the reading pattern is influenced by the learners' experience with educational texts of a specific content type – in this case, biology. The study also confirms and identifies the mechanisms of the regulatory function of the verbal component during the reading of an educational PCT. The implications of this study are both theoretical and practical: it contributes to the understanding of how the cognitive processing of educational texts is carried out and what factors influence it and underscores the importance of the mindful use of images in the design of educational materials. Moreover, its findings can be applied in developing principles for teaching visual literacy.

KEYWORDS: educational text, PCT, polycode text, eye-tracking, native readers, Russian, cognitive processing

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1. INTRODUCTION

The study of the polycode text (PCT), including the educational PCT, has been an active area of research since the end of the 20th century. Recently, this research area has gained new momentum due to the high demand for information presented in the form of units from different semiotic systems and transmitted through various channels, which characterises both the modern reader and the modern learner. The purpose of this study is to identify the principles of semantic integration of the verbal component and the image during the reading of an educational PCT in the native language by Russian-speaking readers.

An analysis of the eye-movement activity of readers of an educational anatomy PCT, with the verbal component in Russian, made it possible to reveal its reading patterns and the reader orientation mechanisms, which are determined by the verbal component and aimed at establishing a connection with the pictorial component. The novelty of the results obtained is primarily determined by the focus on educational text material in the Russian language. In addition, this study for the first time reveals the principles underlying the regulatory function of the verbal component of an educational PCT in Russian during its perception by Russian-speaking readers.

'A special role in obtaining significant information about the processes of PCT perception is played by eye-tracking data, the interpretation of which makes it possible to analyse the sequence of processing different elements of textual information and the proportion of attention allocated to them. Studies aimed at identifying patterns of cognitive processing of PCTs with a verbal component in Russian are currently scarce, and eye-tracking data on the reading processes of Russian speakers engaging with educational PCTs in their native language have been scarcely addressed by researchers'

2. THEORETICAL BACKGROUND

The concept of the PCT aligns with the idea of non-linearity and openness in text organisation, the origins of which trace back to the works of Bakhtin (1986), Barthes (2004), the French school of discourse analysis (Lacan, 1981; Pêcheux et al., 1995; Sériot, 1997; Foucault, 1971), post-structuralist text studies (Derrida, 2016; Kristeva, 2009), critical discourse analysis (Wodak, 2004; van Dijk, 2015; Fairclough, 2023), and others. Within this logic, the formation of the text's content structure is not limited to its verbal component alone but is ensured by the conditions of its functioning.

The opposition of the PCT to the monocode text emerged in linguistics in the 1970s. As a result, researchers argue that *'PCTs in a broad semiotic sense should include cases of combining the natural language code with the code of any other semiotic system (image, music, etc.)'* (Eiger & Yukht, 1974, p. 107). Consequently, within the concept of text non-linearity, a specific aspect arises: the non-linearity of a text's content organisation is determined by the interaction of its verbal component with units of other code systems, which aligns with Paivio's (1986) Dual Coding Theory.

It should be noted that the heterogeneity of code units involved in organising the text's content can be facilitated by a single mode of its transmission or by multiple modes – as a *'socially and culturally conditioned semiotic resource for making meaning'* (Kress, 2009). Forceville (2006) connects them with the five senses, which provide channels for information transmission: (1) the pictorial or visual mode; (2) the aural or sonic mode; (3) the olfactory mode; (4) the gustatory mode; and (5) the tactile mode. Many scholars differentiate the modes of text transmission in a similar way (Kibrik, 2010; van Leeuwen, 2005; Schnotz & Horz, 2009; Lemke, 1998; Jewitt, 2009; O'Halloran, 2004; Machin, 2007; Scollon & Scollon, 2003).

Thus, researchers fundamentally distinguish between the codes of text organisation and the modalities of its transmission: *'If a PCT is one that combines different semiotic codes, then a multimodal text can be called a text that is perceived using different modalities – channels of information perception'* (Nekrasova, 2014, p. 45).

The present study focuses on the specific nature of perceiving a polycode monomodal text, organised based on the interaction of verbal and pictorial codes transmitted through the visual modality. This type of text has been studied in greatest detail both in terms of its internal organisation, which determines the formal-semantic coherence of its heterogeneous components and the communicative unity of their functioning (Anisimova, 2003; Bernatskaya, 2000; Valgina, 2003; de Beaugrande & Dressler, 1981; Halliday & Hasan, 1976; Levin, 1981; Levin et al., 1987; Chernyavskaya, 2009), and in terms of its perception (Kunitsyna, 2010; Sonin, 2005; Sorokin & Tarasov, 1990; Mason et al., 2013; Rayner et al., 2001).

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Studies on the processes and results of PCT perception, in turn, are based on developed theories of reading, for instance, the concept by Hoover and Gough (1990), who consider decoding and comprehension as two main stages in reading comprehension. Decoding is viewed as a basic process of word recognition that provides access to the mental lexicon and the retrieval of a word's semantic information. Comprehension is a higher-level process that involves integrating words and constructing a mental model of the text. Jian (2013) and Lee and Wu (2017) suggest that this reading model can be applied to the analysis of a PCT that includes verbal and pictorial components.

The present study is aimed at identifying the specific features of cognitive processing of educational PCTs. The results of examining the specifics of their reading may prove useful in the development of educational practices, primarily in addressing the problem of effective acquisition of educational information presented in the PCT format (Levin, 1981; Levin et al., 1987; Mayer & Gallini, 1990; Mayer, 2005, 2009; Schnotz, 2005).

Solving this problem relies on theoretical conclusions drawn from psycholinguistic studies of cognitive processing of PCTs by readers.

The most actively developed issue concerns the distribution of significance between the verbal component and the image in PCT perception. Several previous studies investigating the reading of text–picture combinations have found that reading behaviour appears to be largely directed toward the verbal component (Hegarty & Just, 1993; Rayner et al., 2001; Kosenko, 2019).

This conclusion has been reached both in the study of educational texts (Hegarty & Just, 1993; Rayner et al., 2001) and texts of other types – for example, advertising (Rayner et al.,

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2001) or artwork descriptions (Kosenko, 2019). These conclusions were based on various data, the main ones being the following.

1. Data on the sequence of processing the verbal and pictorial components of an educational PCT, reflecting its reading strategies corresponding to eye-movement patterns, allowed for the identification of three main strategies: (a) text-first with references to the image (readers process the verbal part of the PCT, periodically referring to the image); (b) text-first (readers turn to the illustration only after processing the verbal component); and (c) image-first (readers turn to the verbal component only after processing the illustration) (Hannus & Hyönä, 1999; Hegarty, 1992; Hegarty & Just, 1993; Jian, 2015, 2016; Jian & Wu, 2015). The dominance of the verbal component in this case is evidenced by the priority use of strategies (a) and (b).

2. Data on the distribution of visual attention indicated that the proportion of time spent by most readers processing the verbal component of the educational PCT out of the total processing time was greater than that spent processing the image (Hannus & Hyönä, 1999; Jian, 2015).

The proposition concerning the dominance of the verbal component of PCTs, including in the reading of educational texts, is not disputed by researchers, and in the present study we anticipated its confirmation.

At the same time, the question of the mechanisms underlying the integration of the content of heterogeneous components of educational PCTs, as well as the factors determining these mechanisms, remains unresolved.

A number of studies analysing the nature of reading educational PCTs on the basis of eye-tracking data take into account the specifics of their subject domain, although the question of whether reading strategies for educational PCTs depend on the subject domain has been explicitly raised in only a few studies. For example, Jian (2015) draws attention to the importance of visual literacy in extracting meaning from a PCT, which, according to the author, does not depend on its subject area but is determined by general reading and writing practices. In contrast,

Lee and Wu (2017), who study the features of reading geometry texts, believe that in terms of the distribution of visual attention between the components of a PCT, geometric reading is different and is largely focused on the figure. Although they, like their predecessors, conclude that the reading pattern for illustrated geometric descriptions is verbally-oriented (most readers first looked at the text and then studied the corresponding elements in the figure), they emphasise that fixations on geometric figures took up a significant proportion of the participants’ time – almost 40%, since geometry is the study of shape and space.

In substantiating the mechanisms of integrating heterogeneous components of PCTs, researchers identify readers’ prior experience with PCTs of a certain type as one of the significant factors. Such experience determines the anticipated outcome of perception (Jian, 2015; Lee & Wu, 2017; Zlokazov & Lipnitsky, 2018; Kosenko, 2019; Sonin, 2005; Vashunina et al., 2020). An educational PCT may be considered ‘typical’ or ‘familiar to readers’ and therefore processed in a standard way, provided that it corresponds to the principle of organising heterogeneous components characteristic of a given subject domain. For example, Jian and Wu (2015) characterise the images included in their stimulus materials, taking into account their specific features. Drawing on Kress and van Leeuwen (2020), they point out that such illustrations are used to represent part-whole relations in the structure of an object, to indicate the names of individual components of the object, and to display their spatial arrangement. As an example, they cite an illustration of the internal structure of a cell, including the nucleus, the cell membrane, and so forth. Importantly, such illustrations, first, correspond to the semantic and spatial representation of the object and, second, according to Slough et al. (2010), are the most frequently used type in science textbooks. Since educational texts with a verbal component in Russian and their processing by Russian-speaking readers have not previously attracted scholarly attention, it is particularly important in their analysis to consider the typical ways in which information is presented in Russian textbooks.

Differences in the cognitive processing of PCTs across subject domains, revealed through eye-tracking data, are observed in two respects.

First, while not disputing the dominant role of the verbal component in processing educational PCTs, some researchers differentiate the degree of its significance when reading texts from various subject areas. Thus, Jian and Wu (2012), Lin and Lin (2014), and Lee and Wu (2017) noted that in reading geometry texts, fixation durations on figures were relatively high.

Second, according to researchers, data on the cognitive processing of educational PCTs from different subject domains differ with respect to the presence or absence of preferred reading strategies. For example, Hegarty (1992) and Hegarty and Just (1993) documented the absolute priority of the ‘text-with-reference-to-picture’ strategy when reading PCTs in mechanics. By contrast, Jian and Wu (2012, 2015) found that, when working with materials in biology, a substantial number of readers employed the ‘text first’ or ‘picture first’ strategies. They compared

their findings with earlier studies and suggested that one possible explanation lies in differences in the content: materials on mechanical systems can only be understood by relying on images that capture the spatial relations between elements, whereas materials in biology allow readers to extract information about spatial relations from the verbal component of the PCT. Therefore, the ‘text-with-reference-to-picture’ strategy is not necessarily dominant for readers of biology texts (Jian & Wu, 2015). Later, however, Lee and Wu (2017) confirmed the absolute priority of the ‘text-with-reference-to-picture’ strategy when reading geometry PCTs.

Thus, previous studies have provided important observations on how the mechanism of integrating heterogeneous components of educational PCTs is implemented and what it depends on.

However, no definitive conclusions have been reached concerning the specific factors that influence these mechanisms (e.g., particular subject domains, prior experience with them, or the thematic focus of the material).

Since visual perception processes in reading are largely unconscious and not subject to self-control, it seems that valuable insights into this issue can be gained from examining the moments in which readers shift their visual attention from the verbal component of the PCT to the image – that is, when integration occurs. This question can be posed within the framework of analysing the ‘text-with-reference-to-picture’ reading strategy. In studies focused on educational PCTs in biology, the verbal component has not been considered in this respect. In analysing a geometry text, however, Lee and Wu (2017, p. 711–712) noted that *‘the timing of transferring to the figure was the reference to new geometric elements in the text’*, and readers turned to the figure in order *‘to make sure that the spatial relation of geometric elements was in accord with the spatial image formed by reading the text’*.

In our study, we intended to devote special attention to those units of the verbal component of PCTs that direct the reader to the image.

3. MATERIAL AND METHODS

3.1. Research questions and hypotheses

The first question addressed in this study is whether the reading process of Russian-speaking learners of a PCT, typical of Russian biology textbooks, is verbally- or illustration-oriented. Most previous research has found that reading of educational illustrated texts is verbally directed. However, we assume that Russian learners may have a different experience with such texts. Previous studies did not focus on the specifics of educational experience.

In differentiating reading patterns, we used the methodology of Jian and Wu (2015). If a reader initially scans the illustration, fixating at least three times, this movement indicates an image-oriented reading pattern. In this case, we can conclude that the process of examining the figure stimulates the subsequent process of reading the text. Otherwise, we can conclude

that the reading of illustrated PCTs remains text oriented. To answer this question, we used eye-tracking technology to record the readers’ eye-movement patterns.

Furthermore, to identify the dominant role of the verbal component or the illustration, we considered an eye-movement index such as the mean processing time of the verbal component and the image (the ratio of the total processing time of one of the heterogeneous components of the PCT for all respondents to the number of respondents).

The second research question relates to the specifics of processing an educational text in which the verbal and pictorial components, placed in the same frame, may or may not have a semantic link. The formulation of this question is determined by the fact that in textbooks, an image is often placed next to a verbal description that does not correspond to it, which can cause additional difficulties for learners. In this regard, we posed the question of how the processing of the frame changes if the image does not semantically correspond to the verbal description. We determined whether the mean fixation duration on the verbal component and the image differs when processing frames of the two designated types and calculated their level of processing difficulty using the method of Anisimov and Luzhin (2020).

Answering this question also allowed us to make assumptions about the verbal mechanisms for regulating the reading process of an educational PCT. First, we hypothesised that the verbal component contains certain typical elements that trigger a reference to the image. We designated them as verbal predictors of reference to the image. If the hypothesis that there are verbal signals determining the reader’s attention shift to the image is confirmed, it can be argued that the verbal component of an educational PCT regulates the reader’s activity of integrating the meaning of its heterogeneous components, and that the regulatory mechanism is set by the organisation of the verbal component.

Second, we hypothesised that the significance of the regulatory function of the verbal component of the PCT is so high that even in the absence of a semantic link between the verbal component and the image, the verbal predictors will continue to perform their function. An alternative hypothesis was that, upon detecting a semantic mismatch between the verbal component and the image in the early stages of reading, respondents might refuse to refer to the image.

To identify the verbal predictors of reference to the image, we analysed the composition of the fixation zones from which there are progressive saccades to the image and identified the average number of saccades for each such fixation (the ratio of the total number of fixations for each zone to the number of respondents).

Third, we analysed the nature of the verbal units that most regularly referred to the image and attempted to determine whether their content is typical and how it relates to the subject matter being studied. If the content proves to be subject-specific, this will confirm the idea put forward by earlier researchers that

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the nature of educational PCT processing depends on the subject content. Additional insights into these questions may be provided by comparing the data obtained from processing frames with images that semantically correspond and do not correspond to the verbal description: do the verbal predictors identified in the first and second cases coincide?

3.2. Approach and research tools

Due to the lack of reference to contrastive material – educational texts from other subject areas – we did not plan to draw significant conclusions about cognitive processing of PCT in biology. However, in interpreting the results, we used the conclusions obtained in the aforementioned studies, i.e. in mechanics (Hegarty, 1992; Hegarty & Just, 1993), natural sciences (Jian, 2013; Jian & Wu, 2015), and geometry (Lee & Wu, 2017).

At the same time, we paid special attention to the features of the educational text, as it seems to us that the specifics of its functioning and the reader's experience of its perception, acquired in the practices of participating in educational discourse, influenced the resolution of the questions posed.

Within this logic, an educational text is defined as a speech product that *'serves as a means for the primary and secondary textual activities of learners and is understood as methodological and didactic educational material'* (Kuryanovich, 2022, p. 55). Researchers note that the purpose of an educational text is to organise the activities of both the teacher and the student, ensuring the systematisation of the content of the studied discipline (Babakova, 2022, p. 42). First and foremost, an educational text is intended to convey the fundamentals of scientific knowledge corresponding to the curriculum. It is an important source of knowledge for students and a guide for teachers (Tyutkova, 2016, p. 122), reflecting the system of knowledge at a given level of education. Significant features of the educational text for this study are *'(1) the ability to be a carrier of general and professional knowledge; (2) an orientation towards unambiguous perception and construction according to the laws of logical thinking; (3) a special principle of organisation, suggesting that 'such texts have the same set of informative units (semantic blocks), the same set of lexical-grammatical units that realise these meanings'* (Sabinina, 2009, p. 223).

The educational text used by us belongs to texts that have a particular complexity of informational content and a significant multiplicity of information details that the recipient must assimilate.

Given that in most of the studies our work is based on, the type of PCT under consideration is termed an *illustrated scientific text*, we will pay special attention to the relationship between the concepts of *scientific text* and *educational text*.

The use of the term *scientific text* indicates the type of content it represents, reflecting the results of scientific cognition. This type of content implies its presentation in accordance with the laws of logical thinking and an orientation towards unambiguous perception – that is, it has a number of features discussed by researchers when characterising an educational text. At the same time, an educational text has distinctions significant for our research. In our study, we designate the object of the investigated cognitive processing as an *illustrated educational text*, thereby emphasising the purpose and sphere of its use – in educational discourse, and specifically, in a textbook. Within educational discourse, a scientific text possessing these features can be used as an educational text (van Dijk, 1997; Sweller, 1994).

In this regard, the purpose of presenting an educational text – as a product of educational discourse – is the dissemination of knowledge that is new to the learner. Text-based learning is the addition of new information to the reader's background knowledge. The discursive conditions of using an educational text presuppose specifics in its presentation and perception. For this study, particular significance is attached to such conditions of its presentation as a special substantive selection of material corresponding to the reader's background knowledge, and the manner of its presentation, which reflects the typical features of educational experience. The placement of a text in a textbook, for example, presupposes the assimilation of its content by the target group of users of that textbook, and its author selects the material accordingly, arranging it in accordance with the typical attitudes of the educational culture, in particular, with the attitudes of interest to us regarding the use of a PCT that includes a verbal component and an image. Thus, in Russian literature textbooks, it is common to illustrate information presented in verbal form with portraits of writers, reproductions of paintings based on literary works, and so on; in textbooks on technical disciplines – with diagrams of mechanisms' operation, and so on.

Special principles for using PCT also exist in biology textbooks, the material of which is used as a stimulus in the present study. Typical for the educational culture is illustrating the characteristics of a biological object with an image of its structure (we will focus on this in more detail when characterising the stimulus material).

The reader's mindset, according to researchers (Luria, 2009; Shelestyuk, 2010), also plays an important role in the process of text perception. The perception of an educational text also has certain features, and for this study, the readers' mindset for subsequent monitoring of the assimilation of the information

received is important. This mindset is conditioned by a discursive goal – the focus of educational discourse on the dissemination of information, which for the learner as its participant is expressed in the acquisition of new knowledge. The novelty of the information for the recipient and the detail of its presentation is a discursive condition for the functional significance of an educational text: *‘the meaning of the main text is the quintessence of teaching a subject, the basis of the professional properties that we wish to instil in the student to realise the competency-based paradigm of education’* (Kalugin & Prokhorov, 2023).

We took these features of the educational text into account when analysing its cognitive processing during reading.

We used these features of the educational text when interpreting the results of the experiment that recorded the eye movements of a reader of an educational PCT. In its design and implementation, we relied on the extensive tradition of eye-tracking studies of reading, described, for example, in Rayner (1998). Most of these studies were conducted in the so-called ‘default’ reading mode, that is, *‘when comprehension occurs without difficulty and the eyes continue to move forward along the line of text’* (Reichle et al., 2009, p. 9), i.e., with a relatively small number of regressions. This reading mode is certainly used by some respondents at certain stages of reading an educational PCT. However, eye behaviour when perceiving the verbal component and the image during learning activities can differ significantly from that in ‘default’ reading modes, and it is precisely for this reason that many researchers of PCT reading raise the question of the sequence of cognitive processing of the heterogeneous components of an educational PCT, which form its various reading patterns. Moreover, most eye-tracking studies have examined English-speaking readers, not the Russian-speaking readers discussed in this article, whose behaviour may differ significantly.

An NTrend-ET500 was used as the eye-tracker, which has no chin rests, helmets, or other distracting factors, ensuring the most natural user behaviour possible. The scanning frequency can be varied in the range of 60 to 520 Hz. Additionally, the device was equipped with binocular tracking (rather than single-eye tracking) and a face camera.

3.3. Participants

The subjects were students of socio-humanitarian faculties of Tomsk State University (Tomsk, Russia), native Russian speakers ($n = 67$). The subjects were divided into 2 groups, each of which was presented with a separate stimulus. One group was the main group (stimulus 1), and the second was the control group (stimulus 2). The main group included 45 participants, and the control group included 25. Data on the eye movements of three participants from the main group and two from the control group were excluded due to technical flaws in their recording. The subjects read on-screen text consisting of verbal and pictorial components.

All participants signed the relevant ethical and personal information consent forms.

3.4. Stimulus material

The experimental material was an illustrated educational text, adapted from a biology textbook for medical students used in Russia (Sapin & Bilich, 2010, p. 98). The topic of the text was the structure and functions of human skin. The text consisted of 254 Russian words. For stimulus 1, it was accompanied by an illustration from this textbook that semantically corresponded to it (Table 1), and for stimulus 2, by an illustration from the same textbook (Sapin & Bilich, 2010, p. 99) that did not semantically correspond to it (Table 2). The illustration for stimulus 2 was chosen so that its external form corresponded as much as possible to the authentic illustration: it was created in the same visual style (e.g., colour scheme), also reflected the structure of a human body organ, and did not allow the semantic discrepancy to be detected at a first cursory glance. The illustrations for both stimuli were placed above the text, which could stimulate their processing at the beginning of reading, in accordance with the standard pattern of eye movement on a page.

The text conveyed detailed special information but did not contain fragments whose full understanding would be impossible without reliance on specialised background knowledge; that is, the information contained within them was presented in such a way that it could be understood by a non-specialist in the field. The influence of such prior knowledge had to be excluded to achieve maximum attention from readers to all fragments of the text.

The text consisted of three parts: the first, introductory part provided a general characterisation of the layered structure of human skin; the second and third parts described the structure and functions of each layer. The statements that made up the text, in their content, included (1) a description of the spatial relationships between the internal elements of the skin, as in *Под сосочковым слоем находится сетчатый слой* [Under the papillary layer is the reticular layer]; (2) a description of the external features of its individual elements, as in *Благодаря наличию сосочков на поверхности кожи видны гребешки, разделенные бороздками* [Because of the presence of papillae, scallops separated by grooves are visible on the surface of the skin]; (3) an indication of the functions of these elements, as in *Этот слой играет важную роль в терморегуляции и является жировым депо организма* [This layer plays an important role in thermoregulation and is a fat depot for the body]; (4) information supplementary to the structure and functions of the organ, as in *Изучение деталей рельефа кожи (папиллярных линий и узоров) получило название дерматоглифики* [The study of the details of the skin’s relief (papillary lines and patterns) is called dermatoglyphics].

The participants were asked to review the material displayed on the screen and answer some questions about its content. The respondents received the following instruction: *‘Before you on the screen you will see a text followed by several questions. Imagine that you are taking a test, and your answers to the questions will be graded. Please read the text carefully and write your answers on the answer sheet’*. The instruction for subsequent

monitoring of the material assimilation allowed the situation model to be brought as close as possible to the educational conditions for mastering an educational PCT. The content of the questions, as well as the results of the answers, were not considered in this study, which was aimed at studying the process (not the result) of mastering an educational PCT.

It is important to note that, despite the absence of professional knowledge among the subjects – students of socio-humanitarian fields – regarding the content of this text, they had significant experience in mastering similarly organised educational PCTs, gained during their school education. An analysis of three Russian school biology textbooks (Dragomilov & Mash, 2008; Kolesov et al., 2016; Rokhlov & Trofimov, 2007) showed that in terms of illustration content (schematic representation of the structure of a human body organ) and the structure of the corresponding verbal component, PCTs of this type account for 58% to 92% of the content in these textbooks.

Based on this, we can assert that our respondents relied not only on perceptual conditions but also on their discursive experience in establishing a connection between the components of the PCT and had a certain image of the predicted result of its perception, the significance of which is actively discussed by researchers (Vashunina et al., 2020).

Table 1

Mean dwell time in the zones of the verbal component of the PCT and the image

	TOTAL MEAN READING TIME OF PCT, MS	TOTAL MEAN READING TIME OF VERBAL COMPONENT, MS	TOTAL MEAN READING TIME OF VERBAL COMPONENT, %	TOTAL MEAN READING TIME OF IMAGE, MS	TOTAL MEAN READING TIME OF IMAGE, %
Stimulus 1	83091	78306	94.2	4785	5.8
Stimulus 2	101858	92110	90.4	9748	9.6

To address the question of how educational PCTs are read when the accompanying image either corresponds or does not correspond to the content of the verbal component, we analysed the indicators of the overall mean processing time for stimuli 1 and 2, as well as the indicators of mean subjective complexity during their reading.

The indicator of the overall mean processing time for stimuli 1 and 2 was considered significant because readers were allowed to choose a comfortable pace of reading and were not restricted in the time allotted for working with the PCT. As shown in Table 1, this indicator was considerably higher for stimulus 2.

The indicator of mean subjective text complexity was calculated by dividing the number of fixations followed by regressive saccades by the total number of fixations, where a fixation is defined as the concentration of the reader's gaze on specific areas of the text material (Anisimov & Luzhin, 2020). This indicator was also computed for the processing of stimuli 1 and 2. The results demonstrated that processing stimulus 1 required,

4. STUDY AND RESULTS

The results of our study showed the presence of all three previously identified strategies for reading an educational PCT, but for most respondents, the priority of the verbal component of the PCT and the dominance of the 'text-first with references to the image' strategy were confirmed. The absolute majority of respondents used this strategy both when processing stimulus 1 (36 out of 42; 86%), where the illustration content corresponded to the verbal component content, and when processing stimulus 2 (15 out of 20; 75%), where the illustration content did not correspond. Among the respondents of both groups, 82% of readers used this strategy.

In addition, 4 respondents from the group reading stimulus 1 and 3 respondents reading stimulus 2 used the 'text-first' strategy, thus also focusing on the verbal component of the PCT. Only 2 respondents from each group used the 'image-first' strategy, meaning they showed at least three fixations on the illustration at the beginning of reading.

Furthermore, the dominance of the verbal component is indicated by data on the average processing time of the verbal component and the image. For both stimulus 1 and stimulus 2, the dwell time in the verbal component zone was significantly predominant (Table 1).

on average, a smaller number of regressive fixations (mean = 85), and the coefficient of subjective complexity was lower (14.7094%), whereas processing stimulus 2 involved a larger number of regressive fixations (mean = 147) and showed a higher coefficient of subjective text complexity (23.1864%).

Separately, we analysed the mechanisms regulating the process of reading educational PCTs when employing the strategy 'verbal component with references to the image.' An analysis of fixation zones from which progressive saccades to the image were made revealed that the maximum mean number of saccades (five or more per participant) originated from fixations on text components that corresponded in content to statements of the following types: (1) a description of the spatial relationships between the internal elements of the skin, and (2) a description of the external features of its individual elements. Moreover, the analysis of the verbal component of the PCT demonstrated that, for participants in the control group (stimulus 2 – the image does not correspond to the verbal component),

all fragments of this type presented in the text were included as references to the image, while for participants in the experimental group (stimulus 1 – the image corresponds to the verbal component), only three such components were not included (Table 2). The total number of saccades to the image recorded during the processing of stimulus 1 was, on average, 85 saccades per reader, and for stimulus 2, it was 147.

Consequently, the saccades to the image initiated from the identified fixation zones constituted 79% for stimulus 1 and 77% for stimulus 2. Saccades from other fixation zones were isolated (no more than two per zone on average), and therefore can be attributed to random eye movements, and the verbal units forming the corresponding fixation zones cannot be considered typical.

Table 2
Mean (per participant) number of saccades to the image from text components

No.	VERBAL COMPONENT ZONES OF THE PCT	MEAN NUMBER OF SACCADES TO THE IMAGE (STIMULUS 1)	MEAN NUMBER OF SACCADES TO THE IMAGE (STIMULUS 2)
1.	В ней различают сосочковый и сетчатый слои [In it, the papillary and reticular layers are distinguished]	15	20
2.	Сосочковый слой находится под базальной мембраной эпидермиса [The papillary layer is located under the basement membrane of the epidermis]	12	18
3.	Он сформирован рыхлой волокнистой неоформленной соединительной тканью, которая расположена в виде сосочков [It is formed by loose fibrous unformed connective tissue, which is located in the form of papillae]	10	15
4.	Благодаря наличию сосочков на поверхности кожи видны гребешки [Because of the presence of papillae, scallops separated by grooves are visible on the surface of the skin]	8	12
5.	Гребешки, соответствующие возвышениям сосочков дермы... [The ridges, corresponding to the elevations of the dermis papillae...]	7	10
6.	Строение кожного рельефа широко используется для идентификации личности в криминалистике [The structure of the skin relief is widely used for personal identification in forensics]	– / –	8
7.	В сосочковом слое имеются миоциты... [In the papillary layer, there are myocytes...]	– / –	5
8.	Под сосочковым слоем находится сетчатый слой [Under the papillary layer is the reticular layer]	9	10
9.	Наряду с коллагеновыми в сетчатом слое имеется сеть эластических и небольшое количество ретикулиновых волокон [Along with collagen fibers, the reticular layer contains a network of elastic and a small number of reticulin fibers]	6	7
10.	Пучки коллагеновых волокон сетчатого слоя переходят в подкожную основу... [Bundles of collagen fibers of the reticular layer pass into the subcutaneous base...]	– / –	8
TOTAL		67	113

'As expected, our material confirmed the dominance of the verbal component in reading educational PCTs. The data obtained from readers whose educational experience was shaped within the Russian educational environment do not differ from previously reported findings, which demonstrated the dominance of the verbal component in PCTs: in the process of processing a PCT aimed at mastering its content for subsequent control, readers concentrated on its verbal component. At the same time, our data on reading strategies differ from those obtained by Jian and Wu (2015), who reported that a considerable proportion of readers adopted either 'text-first' or 'image-first' strategies when processing educational PCTs in biology'

5. DISCUSSION

As expected, our material confirmed the dominance of the verbal component in reading educational PCTs. The data obtained from readers whose educational experience was shaped within the Russian educational environment do not differ from previously reported findings, which demonstrated the dominance of the verbal component in PCTs: in the process of processing a PCT aimed at mastering its content for subsequent control, readers concentrated on its verbal component.

At the same time, our data on reading strategies differ from those obtained by Jian and Wu (2015), who reported that a considerable proportion of readers adopted either 'text-first' or 'image-first' strategies when processing educational PCTs in biology.

Since in our stimulus material we employed a typical representation of PCTs from Russian biology textbooks, which corresponded to their typical representation in the textbooks analysed by Lee and Wu (2017), it was not possible to assess the impact of educational background.

In addressing the second research question, based on the average reading time of stimuli 1 and 2 as well as their mean subjective complexity, we confirmed the earlier and rather obvious conclusion that presenting verbal text and a non-matching image in a single frame creates additional difficulties for readers in text processing.

This conclusion gains further importance when interpreted in light of the mechanisms of integration of verbal text and image that we identified. These mechanisms are expressed in the unconscious search for correspondence between components during the detection of verbal predictors.

Analysis of fixation zones from which progressive saccades were directed to the image confirmed the presence of predictors within the verbal component that prompt references to the image. These predictors regulate reading when the 'verbal component with references to image' strategy is applied, determining the readers' intention to establish a link between the heterogeneous components of the PCT. Their composition proved to

be stable not only for stimulus 1 but also for stimulus 2. This demonstrates the regulatory function of the verbal component – namely, its role in guiding readers' integration of heterogeneous elements of an educational PCT and the mechanisms by which this regulation is implemented.

We cannot claim that the specific textual fragments we identified will serve as predictors for all PCTs with different subject content. However, for biology PCTs aimed at assimilating knowledge of biological objects, such predictors are clearly manifested. The experience of educational practice directs readers to search in the pictorial component for information about structure and visual features, and this search is triggered by the content of the verbal component. The stable reader needs to turn to the image to confirm information received verbally is realised not spontaneously, but precisely in accordance with the organisation of the verbal component. This indicates not only its dominance but also its regulatory function.

In addressing the issue of whether subject specificity plays a role in the implementation of integration mechanisms of heterogeneous components of educational PCTs, the analysis of the composition of the identified predictors becomes particularly significant.

This content in its representation in Russian is organised by certain verbal units that semantically encode:

(1) *the spatial position of a part of the described object relative to other parts: сосочковый и сетчатый слои (papillary and reticular layers), сосочковый слой находится под... (the papillary layer is located under...), на поверхности кожи видны гребешки (ridges are visible on the surface of the skin), в сосочковом слое имеются... (in the papillary layer there are...), под сосочковым слоем находится... (under the papillary layer there is...), в сетчатом слое имеется... (in the reticular layer there are...), пучки коллагеновых волокон сетчатого слоя переходят в подкожную основу (bundles of collagen fibers of the reticular layer pass into the subcutaneous base);*

(2) *the presence of specific external features of these parts: расположена в виде сосочков (located in the form of papillae), на поверхности кожи видны гребешки (ridges are visible on the surface of the skin), as well as these external features themselves: соответствующие возвышения сосочков дермы (corresponding to the elevations of the papillae of the dermis).* We draw attention to the character of verbal predictors referring to the image. Hegarty and Just (1993) noted that the primary purpose of inspecting a diagram when reading an educational PCT in mechanics is to confirm the spatial relations presented in the verbal description. Similar observations were made by Lee and Wu (2017) when analysing the cognitive processing of geometry texts.

In this study's material, predictors prompting reference to the image include descriptions not only of spatial relations but also of external characteristics of the object, which are likely determined by readers' experience with presenting such information in biology textbooks. This also explains the absence (or rarity) of saccades to the image from verbal fragments that describe

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spatial relations but do not refer to the biological structure of the object (e.g., *На стопе, локтях, концевых фалангах пальцев, подвергающихся постоянному давлению, ячейки сетки широкопеллустые*). Thus, the need to establish a link between verbal and pictorial components of educational PCTs is regulated not only by the content and organisation of the verbal component but also by readers' experience.

Both when a semantic link between heterogeneous PCT elements is present and when it is absent, the overall proportion of saccades to the image from the identified predictors was approximately the same (79% and 77%), and their intensity decreased during reading.

Furthermore, particular interest is raised by the results of comparing the composition of verbal predictors prompting references to the image with the frequency of such references when readers processed stimuli 1 and 2 (Table 2). The number of saccades to the image in the absence of semantic correspondence between components of the PCT was considerably higher than in its presence, which indicates the greater difficulty of processing such material for readers (subjective complexity measures are presented above).

Of greatest interest, however, for addressing the research questions is the distribution of saccades to the image during the processing of stimuli 1 and 2. The data show that when a semantic link between verbal and pictorial components is present, the number of saccades to the image decreases as reading progresses (from an average of 15 saccades at the first predictor to 6 saccades at the last; the exception is the eighth predictor (9 saccades), which marks the beginning of a new part of the text and introduces new content). Some fragments that are formally and semantically capable of referring to the image cease to serve as predictors in the latter part of the text (zones 6, 7, 10). The possibility of inconsistent reference to the image may be explained by the observations of Jian and Wu (2015), who, comparing their data with those of Hegarty and Just (1993), noted that in

processing biology texts, unlike mechanics texts, readers were relatively less dependent on the information presented by images. In this regard, having established a link between components of a PCT at early stages of processing, readers subsequently lose the need for regular confirmation of this link, although when they do confirm it, they rely on the identified verbal predictors.

When no semantic link is present between the components of a PCT, a relative decrease in the mean number of saccades to the image also occurs from the beginning to the end of reading. However, all fragments that are formally and semantically capable of referring to the image consistently function as predictors, despite the potential independence from the image's content. Thus, the failure of early attempts to establish a link between verbal and pictorial components of a PCT does not diminish the functionality of verbal predictors. Encountering them during reading, respondents subconsciously continue to actively refer to the image.

6. CONCLUSION

The conducted study contributes to the development of the concept of perception of an educational PCT, and specifically, it reveals the mechanisms by which a reader establishes a connection between its heterogeneous elements. For the first time, such mechanisms of integration were identified. Moreover, this type of study, conducted using the eye-tracking method, was for the first time carried out on data concerning the cognitive processing of an educational PCT in Russian by Russian-speaking readers.

This study confirmed the dominance of the verbal component of the PCT in conditions that orient towards subsequent monitoring of the knowledge obtained. This conclusion corresponds to the results obtained earlier from data on the processes of reading educational PCTs (Jian & Wu, 2015; Lee & Wu, 2017). It is based on the absolute prevalence of the chosen reading strategy 'text-first with references to the image', as well as the significantly larger proportion of time spent processing the verbal component compared to the proportion of time spent processing the image. Differences between the strategies used by readers were not considered in this study.

At the same time, a comparison with the results of the aforementioned studies, conducted on the basis of an analysis of the processes of reading texts of various subject content, as well as taking into account the typical principles of placing a PCT in biology textbooks, gives reason to believe that the nature of reading is influenced by the learners' experience gained when working with educational texts of a certain content type. The coincidence of the results of using this experience is determined by the unity of information presentation in biology textbooks.

This assumption, of course, needs further clarification with the involvement of data on the reading of educational texts of other content types.

Furthermore, the study confirmed the regulatory function of the verbal component of an educational PCT during its reading. This function is manifested in the presence of a stable set of

verbal predictors of reference to the image, which determine the reader's need to establish a connection between the heterogeneous elements of the PCT in situations where information about the structure of the described object is found in its verbal component, which he is accustomed to receiving in the form of a PCT within his educational experience. The composition of the verbal predictors that realise the regulatory function corresponds in content to the potentially visualisable information that is usually presented in the image in textbooks. This conclusion is confirmed, firstly, by the consistent focusing of saccades to the image on verbal units of a certain type, and secondly, by the preservation of their regulatory function in the absence of a semantic link between the heterogeneous elements of the PCT, and even by the strengthening of its activity. The activity of the regulatory function of the verbal component in the absence of its semantic link with the image confirms the idea that readers

implement the mindset to establish a connection with the image already at the first stage of text understanding – at the decoding stage, that is, at the stage of extracting semantic information from individual components of the text.

Additionally, the study showed that the discrepancy between the information presented in the image and the content of the verbal component of the PCT greatly complicates the reading process. This is especially important because, as our data show, the reader cannot ignore the image and unconsciously continues an active search for a connection throughout the entire time of processing the verbal component.

The results of the study are important for the organisation of educational practices, in particular for the processes of teaching visual literacy in a specific subject domain, as well as for the effective placement of educational text presented in polycode form.

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Book Reviews

Surviving the induction years of language teaching: The importance of reflective practice (book review)

Original work by Thomas S. C. Farrell published by Equinox Publications, 2024

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Farrell's study of English as a Second Language and the importance for teachers of developing reflectivity on their work and development in the classroom is an important initiative in developing teachers' careers and in teacher training. The key aim of this book is to show how teachers can and should reflect on the quality of their work and use what they find to improve their classroom methodology and their attitude to teaching language classes.

In fifteen chapters Farrell studies the career of a Canadian ESOL (English for Speakers of Other Languages) teacher called Roger (not his real name) and his reflection on his first to third years of teaching and its effect on his attitude to his classes and his methodology.

Roger graduated from university in Canada with an MA (Master of Arts) in Applied Linguistics with a major in TESOL (Teaching English to Speakers of Other Languages) and started work in language learning and teaching. He himself was not from the English-speaking part of Canada and he was teaching foreigners living in Canada who needed to learn English as a foreign language. Guided by Professor Farrell, he learned to apply reflective practice to his teaching to learn lessons about his attitude, his methods and his confidence in his teaching over the first three years of work.

The book is divided into 15 chapters, focusing on Roger's feelings about his first year after graduation and his third year of teaching, what problems he has faced and what solutions he has found. Other chapters explore the role of reflection on one's teaching and understanding why problems may have occurred and how the process of systematic reflection on a teacher's working environment, the courses taught, the quality and response of the students and the effectiveness of the methodology can improve. Above all, it explores how the key issue of engaging with students in the classroom works and can work better. As Farrell states, many novice teachers drop out in the early years of teaching. In his view, developing the ability of novice teachers to reflect on their teaching style and attitude can help them make any adaptation of their attitude and methodology to ensure their success.

A very positive feature of each chapter is where Farrell invites readers to reflect on their own classroom activities, maybe by recording a class and when playing back the recording reflecting on the teacher's voice volume, pronunciation and what he or she notices about the students. This section, entitled *Reflective Break*, is very useful as an activity for use in teacher training classes. Farrell stresses that the first year of class teaching can be very different from the experience of being a student

'So, what is reflectivity and how does it work? It's about standing back after classes, seeing and thinking about what happened and seeing how you feel about it and what works and what maybe you need to change. One way, Farrell suggests, is to record your class on video or audio and listen and note what you think worked and what didn't. Write it down. A written record of your experience will stimulate your thinking about the class and how best to respond. You might undertake the process of reflection on your own, with peers or with mentors or supervisors, recording your experiences in the classroom in writing or using sound or video recordings and reflecting on how you might improve and help you respond to challenges you might have encountered'

in a university or a teacher training school. Many crises can occur and the ability to reflect on these is an important part of novice teacher development and encourages them to stay in their jobs.

So, what is reflectivity and how does it work? It's about standing back after classes, seeing and thinking about what happened and seeing how you feel about it and what works and what maybe you need to change. One way, Farrell suggests, is to record your class on video or audio and listen and note what you think worked and what didn't. Write it down. A written record of your experience will stimulate your thinking about the class and how best to respond. You might undertake the process of reflection on your own, with peers or with mentors or supervisors, recording your experiences in the classroom in writing or using sound or video recordings and reflecting on how you might improve and help you respond to challenges you might have encountered. An effective reflective process might cover your teaching approaches and methods, your personality, your experiences as a teacher, what works best for you and what doesn't work so well and what your school or educational institution has established as good practice.

In doing his reflections, Roger realised that his training had not prepared him for the reality of working with students in a real language learning class; an important lesson for teacher trainers who may concentrate on principles rather than on practice and, where possible should provide students with the opportunity to work in a classroom as part of teaching practice. For Roger, his first year's reflection led him to focus on how to give new information to his students, how to give examples and how to make grammar practical using real life examples. He also reflected on how he asked questions and how he felt about himself as a teacher.

From Farrell's point of view, teachers' emotions in relation to their teaching are an important thing to reflect on. In Roger's case, he listed confidence, curiosity, excitement and enjoyment. However, as Farrell points out, teachers in the classroom are

very much left to sink or swim and being able to recall and state their emotions is a good way for novice teachers to understand their level of satisfaction or dissatisfaction in their teaching. As Roger experienced at the end of his second year, a 'bad' class can affect how you operate, with Roger depending on his personality rather than methodology to manage the class with a degree of success. He was also conscious of putting his learners' needs first but experienced certain difficulties in adapting to the different and diverse cultural backgrounds of many of his students. He tended increasingly to focus on PowerPoint presentations as a way of introducing grammatical constructions but came to realise that it was getting in the way of practice and student interaction.

So, while focusing on Roger's varied experience with language classes and his advantages and challenges, not to mention the gap between his language teaching course and his classroom experience, what principles would Farrell propose to help practising teachers improve their performance and overcome difficulties in the classroom?

First, he suggests novice teachers try to develop some new routines but not to fall into a routine where you are always doing the same. Secondly, try new things so that you don't fall into a rut. Thirdly, remember your students are changing all the time and a bad term this term may be better next term. Fourth, make a practice at the end of term of reflecting on your own or with colleagues what went right and what went wrong and needs changing. Fifth, find a 'buddy' who you can exchange with as the teaching progresses, exchanging views on how things are going and how issues can be dealt with.

In creating a programme to review and assess the achievements in teaching a course and the challenges teachers may face, Farrell suggests reviewing the following points.

1. *Opportunities.* A school should create opportunities for teachers to exchange experiences and raise and discuss issues through group discussion, journal writing and classroom observation.

2. *Ground rules.* In order not to drift off the subject it is worth agreeing ground rules for teachers to use in exchanges. Three or four rules should be sufficient.

3. *Time.* This is important in a teacher's life. The time allotted to reflective practice and discussion should depend on four fundamental factors, the time that the meeting should last, the length of a teacher's discussion of their activity, and how long it takes to develop the relationship and the discussion between the participants. The final factor is the period for reflection, the time it is estimated to take to complete the process. All these factors should be agreed by the group before they start the reflection.

4. *External input.* In the reflective process teachers will be discussing their own experiences of what has happened in class and how they felt about it. However, as well as the personal input participants might want to consider evidence from academic journals and information about what other groups of teachers have done.

5. *Trust*. Inevitably, some of the issues raised by teachers based on their classroom activity may cause anxiety. It is important that the teachers in the reflective practice session develop confidence and trust in each other to avoid anxiety and concern about sharing difficulties.

Teachers are generally busy and don't have a lot of time to discuss at length the issues that have arisen in the classroom and affected the transmission of knowledge and getting the students to practise the language they are learning. Nevertheless, as Farrell summarises in his book, recording critical incidents that arise

in class, being aware of issues and problems that arise in class, and noting insights that occur which might affect methodology and materials introduced in future classes and how they are used is important.

In summary, this is a practical and useful presentation of reflectivity, what it is, how to put it into action and how it can affect the teaching especially of novice language teachers for the better. In addition, the example of Roger's teaching, his experiences in the classroom and how record them, reflect on them and act on them is especially valuable.

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News & Events

RUDN University News

Students of the Faculty of Economics Participate in Winter School in Cuba

A group of students from the Faculty of Economics and the Faculty of Humanities and Social Sciences, accompanied by Associate Professor Irina Viktorovna Smirnova of the Department of Foreign Languages, recently returned from a two-week Winter School in Cuba. Upon their return, they shared the most memorable highlights of their experience.

During the Winter School, participants had the opportunity not only to study Spanish and English at the University of Havana but also to engage with Cuban culture and traditions while building meaningful connections with local students.

From attending a scientific fair and meeting the Ambassador of the Russian Federation to visiting a crocodile farm, the students experienced a wide range of academic and cultural activities. The programme concluded with a certificate ceremony marking the successful completion of their studies.

Master's Programme in Linguistics: Chinese Language Track at RUDN University

RUDN University's Institute of World Economy and Business offers a Master's programme in Linguistics entitled *Foreign Language for Professional Communication and Specialised Translation* with a specialisation in Chinese.

Associate Professor Cao Chen, a native speaker of Chinese and lecturer at the Department of Foreign Languages of the Faculty of Economics, provided details about the programme and the opportunities it opens for students. Among them are development of oral and written professional communication skills in Chinese; training in oral and written translation; translation internships in companies based in Beijing; and the possibility of obtaining a double degree from RUDN University and Beijing Language and Culture University.

The programme is led by Elena Nikolaevna Malyuga, Doctor of Philology, Professor, Head of the Department of Foreign Languages of the Faculty of Economics, and Academician of the Russian Academy of Natural Sciences.

Applications are now open for the Master's programme *Foreign Language for Professional Communication and Specialised Translation* (Chinese track) at the Institute of World Economy and Business, RUDN University.

Virtual Reality Language Courses at RUDN University

The Department of Foreign Languages of the Faculty of Economics has introduced innovative VR-based courses, marking a breakthrough in 2024 for the integration of virtual reality into foreign language education.

Virtual reality is no longer limited to entertainment. It has become a powerful tool in education, offering immersive experiences that allow students to practice foreign languages in authentic communicative settings. Using specialised applications, virtual classrooms have been created where students interact with virtual interlocutors, engage in various scenarios, and immerse themselves in a language-rich environment. VR technologies enable students not only to hear and read utterances but also to experience them in context, thereby deepening comprehension and enhancing retention. Already, students are engaging in scenarios such as conversing with a bank employee, shopping, attending a networking event, or discussing a conference with a colleague, all without leaving the classroom. The approach also proves particularly effective in improving pronunciation, as the system encourages students to repeat phrases until they achieve accuracy. These VR courses represent a significant step forward in language learning, offering a unique combination of interactivity, immersion, and practical skill development.

RUDN Students' Summer Internship in Beijing

Students of the Faculty of Economics at RUDN University have embarked on a two-week summer internship in Chinese language and culture at Beijing Language and Culture University. The internship provides students with the opportunity to improve their Chinese language proficiency, explore cultural traditions, and engage with international peers. It represents a valuable academic and personal experience, combining intensive study with cultural immersion.

The opening ceremony highlighted the importance of academic cooperation and cultural exchange. Chinese professors expressed hope for fruitful study and strengthened ties between the universities. Representing the students, Tsokto Zhargalov delivered words of gratitude in Chinese, after which students took placement interviews to determine their language level.

In the first days of the programme, students visited several cultural landmarks – including Beihai Park, the Lama Temple, and the Olympic Stadium – while becoming familiar with the university campus and Beijing's metro system. Students explored the Temple of Heaven, a 15th-century architectural and cultural complex famed for its acoustic marvels such as the Echo Wall and the Triple Echo Stone. Standing on the Stone of the Heavenly Soul, students tested the site's unique properties and made traditional wishes. The symbolism of visiting the Temple of Heaven on 'the day of heaven', as Sunday translates from Chinese, added particular significance to the experience. Students also attended a traditional tea ceremony, where they learned proper brewing techniques and sampled six varieties of Chinese tea, further enriching their understanding of Chinese culture.



News & Events

RUDN University Economics Students Participate in Educational Programme at Seoul National University

Students of the Faculty of Economics at RUDN University concluded their summer with an educational programme at Seoul National University, one of the leading higher education institutions in the Republic of Korea.

The programme was designed to promote academic exchange and intercultural competence among participants. As part of the curriculum, students attended a series of lectures devoted to Korean culture, history, and the Korean language. These sessions provided a deeper understanding of South Korea's cultural heritage and its role in shaping modern society, while also offering practical opportunities to acquire elementary skills in the Korean language.

Equally important was the intercultural dimension of the programme. Engaging with their peers in an international academic environment, RUDN students strengthened their ability to communicate across cultural boundaries and to build professional contacts in a global context. Such skills are increasingly valuable for future economists who will operate in a highly interconnected world.

The educational trip demonstrated the importance of combining academic training with international exposure. It not only broadened students' intellectual horizons but also equipped them with competencies essential for participation in the global academic and professional community.

TLC News

TLC Indexed in the Russian Science Citation Index

Training, Language and Culture has been successfully indexed in the Russian Science Citation Index (RSCI), a leading national platform for tracking and evaluating the publication activity of researchers and academic journals. Inclusion in RSCI marks an important stage in the journal's development, as it not only reflects its compliance with high editorial and scholarly standards but also broadens its accessibility to the academic community.

For authors, RSCI indexing ensures that their work published in the journal is more widely discoverable, increasing its visibility to colleagues across disciplines and enhancing citation potential. For readers, it provides reliable access to current research in linguistics, language education, intercultural and professional communication, and related areas.

This achievement strengthens the journal's position in the Russian academic landscape and further integrates it into the broader system of national scientific knowledge dissemination, ensuring its visibility, accessibility, and long-term contribution to the development of scholarly communication.

TLC Improves Its Standing in Science Index Rankings

According to the most recent data published by the Russian Index of Science Citation, Training, Language and Culture has achieved growth in its Science Index ranking. The Science Index is a complex bibliometric indicator that evaluates the impact and influence of academic journals based on citation data, article quality, and the significance of contributions to the scholarly community.

An upward movement in the Science Index demonstrates that the journal's publications are increasingly referenced by scholars in Russia and internationally. This reflects the growing demand for research disseminated through the journal and confirms the relevance of its focus on professional communication, linguistics, education, and cultural studies. Rising positions in the Science Index attest to the trust of the academic community and contribute to the reputation of the journal as a stable and reliable platform for publishing high-quality research. This growth is a reflection of the long-term strategy of the editorial team aimed at enhancing academic visibility, expanding readership, and strengthening international partnerships.

TLC Establishes Policy on AI-Assisted Technologies in Academic Publishing

In response to the growing use of artificial intelligence in scholarly writing and research, Training, Language and Culture has adopted a comprehensive policy regulating the use of AI-assisted technologies in manuscript preparation, peer review, and editorial processes. The policy sets clear standards to ensure transparency, research integrity, and accountability while acknowledging the potential benefits of AI in limited contexts.

For authors, AI-assisted tools may be used solely for improving the linguistic quality and readability of texts, but always under human supervision. Authors remain fully responsible for verifying the accuracy of their manuscripts, particularly in relation to references and translations. AI-generated or fabricated citations are strictly prohibited, as is reliance on AI-generated summaries in place of engagement with original sources. If AI translation tools are employed, authors must carefully verify accuracy and nuance. All use of AI must be disclosed in the submitted manuscript, and this information will be included in the published article. Importantly, AI tools cannot be credited as authors, as authorship implies intellectual contribution and accountability that only humans can provide.

For reviewers and editors, the policy is even more restrictive. Manuscripts and review materials must never be uploaded to AI tools, as this could compromise confidentiality and intellectual property rights. The peer review and editorial decision-making processes are considered exclusively human responsibilities, requiring expertise, judgment, and ethical accountability.

Editors are permitted to use AI only in secure administrative tasks such as checking manuscript completeness or detecting plagiarism, where confidentiality can be safeguarded.

To support implementation of the policy, the journal employs RUDN University's verification software to check all submissions for both similarity and AI-generated content. Manuscripts that rely on AI beyond permitted linguistic assistance,

such as for generating arguments, structuring sections, or producing content, may be rejected, and resubmission of such manuscripts will not be permitted. Through the introduction of this policy, Training, Language and Culture affirms its dedication to protecting academic standards, ensuring the reliability of published research, and promoting transparency in an era of rapidly evolving technological tools.



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